UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

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Data Assimilation
Meteorological Office
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Devon
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from UKMO global model.
Observation times	:All hours
Elements monitored	:Mean sea level pressure (hPa). :Wind speed ($m\ s^{-1}$). :Wind direction (Degrees). :Air temperature (Degrees C). :Relative Humidity (%). :Sea surface temperature (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:PGE	:Percentage of observations with gross errors.
:%REJ	:Percentage of observations flagged excluding those with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)
:15 degrees (air temperature)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 $m\ s^{-1}$	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
	≥ 4 degrees	(air temperature)
	≥ 15%	(relative humidity)
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
	≥ 6 degrees	(air temperature)
	≥ 25%	(relative humidity)
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8AS7	P	23	0	70	0.6	4.5	4.5
C6QE3	P	28	0	64	5.1	6.5	8.3
DANV	P	20	0	70	1.8	4.1	4.4
MANE	P	74	0	0	0.7	4.6	4.6
OXFO2	P	30	0	80	2.1	-4.1	4.7
PBCJ	P	40	0	90	1.1	-5.5	5.6
SXVF	P	26	4	81	1.5	4.5	4.7
TEST	P	110	97	100	5.9	-4.5	7.5
UDUR	P	25	0	100	1.9	7.0	7.3
UIZE	P	23	0	70	2.8	5.3	6.0
WCY7054	P	23	0	48	1.6	4.2	4.5
WDJK	P	59	0	5	2.0	-4.3	4.7
3FPS9	P	34	0	3	1.5	-4.1	4.4
3FRA8	P	23	0	39	5.9	4.0	7.1
31056	P	40	82	95	8.4	-1.8	8.5

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
C6NR5	SPEED	37	3	92	4.9	13.2	14.1
ELWX5	SPEED	58	28	48	6.8	4.4	8.1
ELZF9	SPEED	35	0	31	4.1	5.4	6.7
ELZX2	SPEED	45	0	38	2.7	5.5	6.2
LAVX4	SPEED	34	0	12	4.0	5.2	6.5
SLCH	SPEED	28	0	29	6.6	6.5	9.3
TSMU	SPEED	34	15	76	6.6	13.4	15.0
3FEI6	SPEED	73	0	100	2.5	5.6	6.1
3FZM6	SPEED	24	0	46	5.8	5.6	8.1
44018	SPEED	84	0	5	3.1	-5.3	6.1
9MBX5	SPEED	28	0	14	4.1	5.3	6.7

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
PDYX	DIRN.	21	10	0	133.2	-11.4	133.7
44138	DIRN.	171	0	0	16.5	-40.8	44.0

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGDT	T	369	2	100	2.8	-9.5	9.9
CG2965	T	169	0	100	1.6	4.8	5.1
NBTM	T	114	4	100	3.4	7.1	7.9
PBVO	T	21	0	100	2.1	-4.4	4.8
PJWI	T	42	19	100	4.4	4.3	6.2
SP32	T	124	4	100	4.9	-7.3	8.8
TEST	T	110	30	100	6.5	4.6	8.0
UCJS	T	24	0	100	2.3	-4.6	5.1
UFAA	T	84	0	100	2.1	5.2	5.6
UHIB	T	20	0	100	3.1	5.7	6.5
WCW9126	T	88	10	100	4.5	4.6	6.4
WWU8	T	35	29	100	3.2	8.0	8.7
46081	T	741	3	100	3.2	9.0	9.6
46131	T	501	0	100	2.8	5.1	5.8
46146	T	263	0	100	1.6	4.8	5.0
7KXF	T	25	28	100	3.0	-1.7	3.5

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8AW2	RH	33	0	100	13.3	15.5	20.4
A8CC4	RH	47	0	100	12.5	19.2	22.9
CG2958	RH	29	0	100	15.1	-16.6	22.4
FNAT	RH	71	0	100	8.1	24.9	26.2
JBGY	RH	92	0	100	9.8	18.8	21.2
JEGI	RH	28	0	100	6.8	-19.1	20.3
JSVY	RH	81	0	100	9.2	-20.9	22.9
JXIW	RH	97	0	100	20.4	-15.1	25.4
MSHE2	RH	87	0	100	7.3	18.9	20.3

MYJG2	RH	49	0	100	9.5	16.4	19.0
SCKM	RH	26	0	100	25.5	-6.0	26.2
SKPE	RH	22	0	100	35.3	-17.8	39.6
V2RA	RH	45	0	100	8.5	19.1	20.9
V2UQ	RH	20	0	100	10.6	18.8	21.5
V7DQ8	RH	46	0	100	8.7	15.7	17.9
XXUU	RH	79	0	100	8.7	17.8	19.8
ZSWAV1	RH	41	0	100	8.6	-40.5	41.4
3EBX6	RH	22	0	100	19.4	-16.5	25.5
4XFO	RH	25	0	100	26.4	1.3	26.4
4XGS	RH	20	0	100	11.7	19.8	23.0
44007	RH	707	0	100	10.4	-18.5	21.2
44018	RH	77	0	100	37.2	-65.7	75.5
62402	RH	42	0	100	9.9	-16.4	19.2

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8DO8	SST	26	0	65	1.2	4.4	4.6
C6YW	SST	20	0	90	0.6	-3.8	3.8
ELWY3	SST	35	0	100	0.5	3.4	3.4
ELZT3	SST	538	96	114	0.3	0.4	0.5
ELZV9	SST	51	14	100	5.1	-2.1	5.5
KRPB	SST	57	0	100	1.0	-3.1	3.3
KS001	SST	126	0	68	0.7	-4.4	4.4
KS035	SST	92	1	67	2.3	3.1	3.8
LAJV4	SST	48	0	100	1.3	3.0	3.3
PPSV	SST	25	0	100	1.3	-3.2	3.5
P3FW9	SST	37	0	35	2.1	-3.4	4.0
P3GT9	SST	47	0	66	1.3	-4.3	4.5
SLCH	SST	28	0	100	1.0	3.8	4.0
S6IW	SST	61	2	54	2.2	3.7	4.3
S6TS	SST	30	13	100	2.5	-4.3	5.0
UCBM	SST	70	0	59	2.1	-4.5	5.0
UHVW	SST	23	0	100	0.7	3.1	3.2
VRZN7	SST	31	13	61	3.6	3.2	4.8
V2AR5	SST	79	0	101	1.7	3.1	3.5
V2OH1	SST	32	0	66	2.2	-4.6	5.1
V7DN3	SST	41	2	56	1.7	-4.3	4.7
WRFJ	SST	27	0	100	1.8	3.1	3.5
ZDFK7	SST	20	25	55	3.3	-4.1	5.2
ZMFR	SST	180	92	100	1.0	-8.0	8.1
3FRA8	SST	20	10	70	2.4	-4.4	5.0
3FRR5	SST	65	0	100	0.9	3.8	3.9
31056	SST	155	59	100	5.3	0.9	5.4
41008	SST	739	0	93	0.6	-4.1	4.1
42007	SST	740	0	90	0.8	-3.6	3.7
42013	SST	722	0	76	0.6	-3.3	3.3
7KXF	SST	24	29	50	0.6	0.0	0.6
9VIH	SST	22	0	100	0.7	3.8	3.9

Figure 1. SHIP/SYNOP mean daily count. JANUARY 2004
All hours
Global average number of observations in 24 hours = 20931

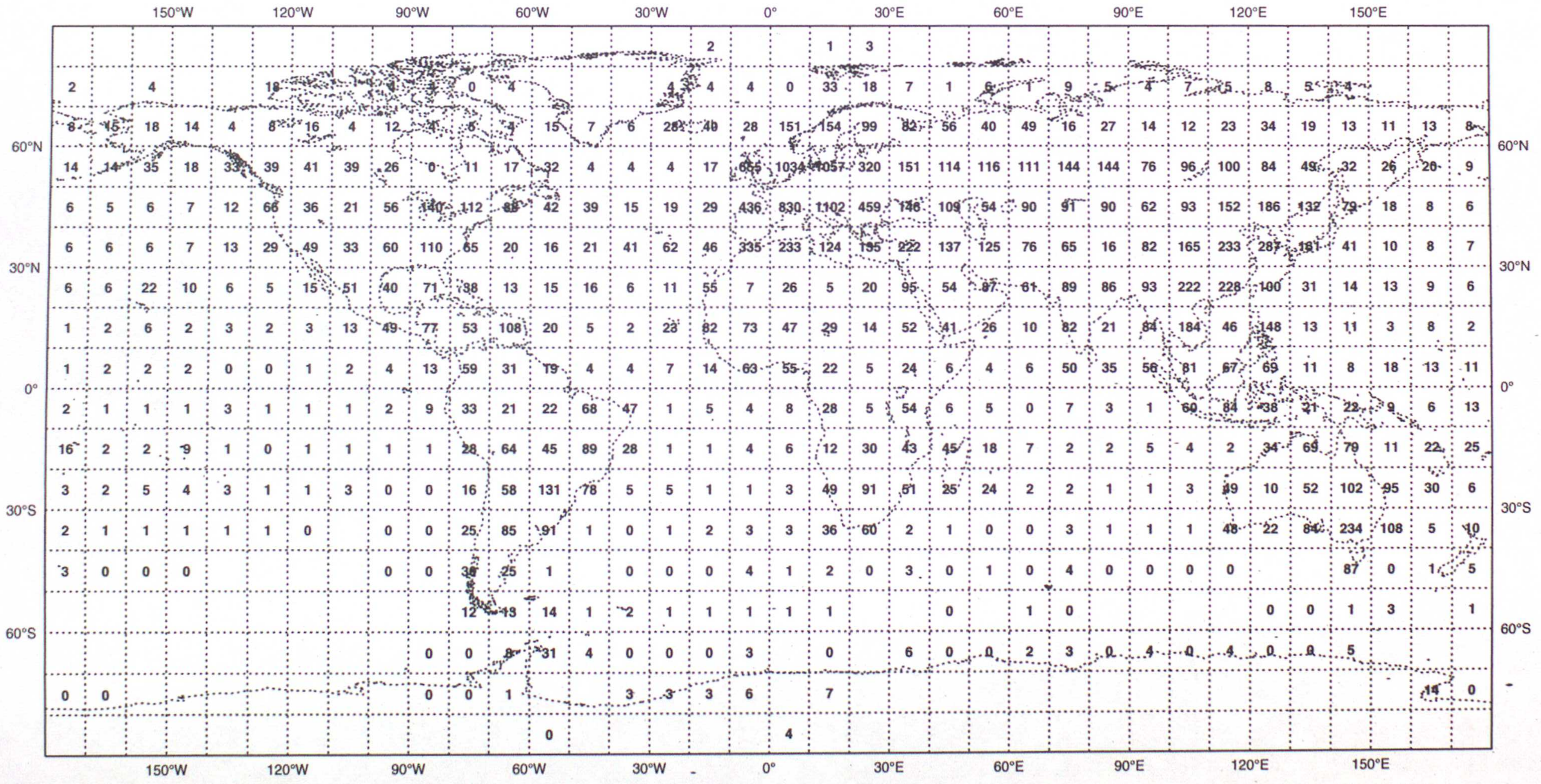

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times : All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:PGE	:Percentage of observations with gross errors.
:%REJ	: Percentage of observations flagged excluding those with gross errors
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT

:15 hPa	(pressure)
:25 m s^{-1}	(vector wind)
:10 degrees	(sea surface temperature)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
16575	-46.3	58.8	P	90	10	50	4.8	5.2	7.1
46661	54.8	-132.5	P	74	32	36	0.7	-1.3	1.5

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41655	22.3	-69.6	SPEED	50	0	100	4.7	6.6	8.1
46781	51.8	179.6	SPEED	28	89	100	5.3	17.4	18.2

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41595	27.1	-40.3	DIRN.	191	0	0	23.6	-34.0	41.4
46781	51.8	179.6	DIRN.	27	93	0	35.1	73.3	81.3

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13609	15.3	-23.2	SST	79	0	97	1.2	6.2	6.3
17663	-38.5	9.5	SST	607	0	68	1.6	3.0	3.4
22595	13.8	109.2	SST	25	100	100			
22923	17.1	110.4	SST	102	59	94	2.6	6.8	7.3
32693	3.7	-122.2	SST	543	0	100	0.4	3.0	3.0
33502	-31.8	-16.9	SST	98	0	100	0.7	4.2	4.2
46661	54.8	-132.5	SST	34	3	79	3.0	-6.0	6.7
46972	18.2	-170.6	SST	175	0	100	0.2	4.4	4.4
51769	14.4	127.2	SST	42	0	100	0.2	-7.4	7.4
53595	28.5	129.7	SST	36	3	72	4.1	-3.1	5.1
53602	20.8	115.8	SST	27	30	89	3.2	4.4	5.4
71598	-59.1	-24.9	SST	146	76	76	0.2	-0.5	0.5

Figure 2. DRIFTER mean daily count. JANUARY 2004
All hours
Global average number of observations in 24 hours = 11184

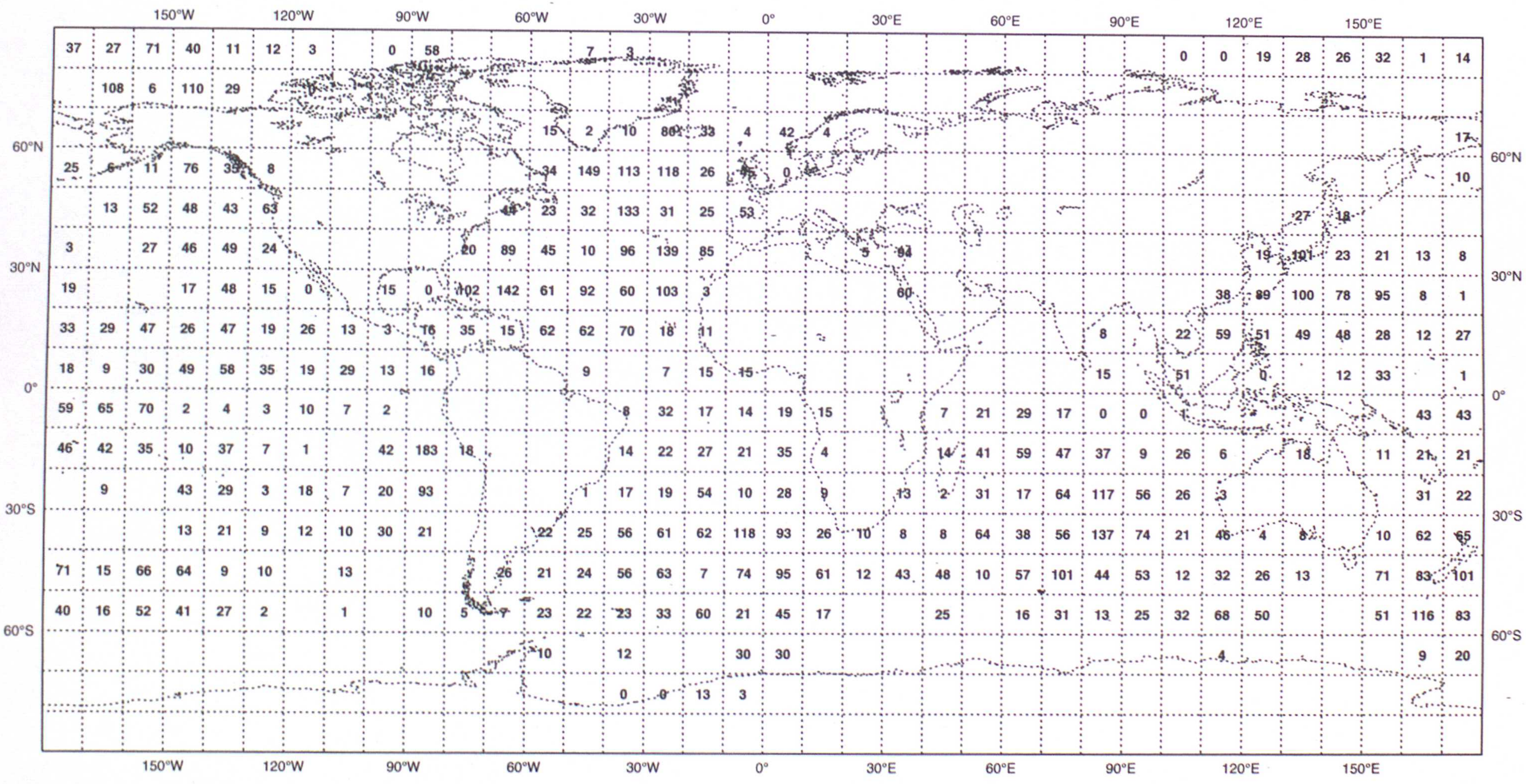

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
37 27 71 40 11 12 3 0 58 7 3 0 0 19 28 26 32 1 14
108 6 110 29
15 2 10 86 33 4 42 4 17
25 6 11 76 35 8 34 149 113 118 26 15 0 10
13 52 48 43 63 48 23 32 133 31 25 53 27 18
3 27 46 49 24 20 89 45 10 96 139 85 5 94 19 101 23 21 13 8
19 17 48 15 0 15 0 102 142 61 92 60 103 3 60 38 89 100 78 95 8 1
33 29 47 26 47 19 26 13 3 16 35 15 62 62 70 18 11 8 22 59 51 49 48 28 12 27
18 9 30 49 58 35 19 29 13 16 9 7 15 15 15 51 0 12 33 1
59 65 70 2 4 3 10 7 2 8 32 17 14 19 15 7 21 29 17 0 0 1 43 43
46 42 35 10 37 7 1 42 183 18 14 22 27 21 35 4 14 41 59 47 37 9 26 6 18 11 21 21
9 43 29 3 18 7 20 93 1 17 19 54 10 28 9 13 2 31 17 64 117 56 26 3 31 22
13 21 9 12 10 30 21 22 25 56 61 62 118 93 26 10 8 8 64 38 56 137 74 21 46 4 8 10 62 65
71 15 66 64 9 10 13 26 21 24 56 63 7 74 95 61 12 43 48 10 57 101 44 53 12 32 26 13 71 83 101
40 16 52 41 27 2 1 10 5 7 23 22 23 33 60 21 45 17 25 16 31 13 25 32 68 50 51 116 83
10 12 30 30 4 9 20
0 0 13 3

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION JAN 200

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	62	0	0	0	0.8	-10.0	10.0
60728	36.4N	10.7E	1	MS	65	0	0	0	0.5	-8.9	8.9
61816	10.9N	14.3W	69	MS	38	13	34	0	0.7	-2.1	2.2
62056	32.8N	21.8E	625	S8	42	1	2	0	0.8	-5.5	5.6
62790	12.1N	24.9E	674	S	48	4	8	6	1.9	4.0	4.4
63801	4.9S	29.6E	882	S8	54	2	4	0	1.0	8.4	8.5
63881	8.0S	31.6E	1923	S	42	5	12	2	3.0	12.5	12.9
64654	8.4N	20.6E	510	MS	36	1	3	0	1.8	4.3	4.7
65355	9.8N	1.1E	342	MS	120	0	0	2	1.6	-12.6	12.7
68014	19.6S	18.1E	1411	S8	30	0	0	0	2.9	-5.0	5.8
68016	19.3S	12.7E	16	S8	33	14	42	0	1.0	3.0	3.2
68030	18.5S	25.6E	1071	8	82	3	4	0	4.4	6.5	7.8
68300	26.6S	15.1E	16	MS	63	39	62	0	6.6	-9.2	11.3
68312	26.5S	18.1E	1067	S8	22	3	14	0	0.6	4.5	4.5
68372	26.9S	29.2E	1563	S8	119	0	0	0	0.6	4.7	4.7
68396	26.5S	31.3E	641	8	57	1	2	4	1.0	4.9	5.0
68575	30.0S	30.0E	1175	S8	119	119	100	0			
68674	31.6S	29.6E	47	M	33	1	3	55	1.6	6.6	6.8

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24329	66.3N	114.3E	236	MS	93	0	0	1	2.3	4.5	5.1
24671	63.9N	135.9E	402	MS	109	1	1	0	1.2	4.8	4.9
30542	54.9N	111.2E	563	MS	110	3	3	22	4.4	4.1	6.0
30554	54.5N	113.6E	995	MS	124	0	0	0	3.5	8.7	9.4
31123	57.8N	130.9E	255	MS	121	1	1	0	1.5	5.2	5.4
35416	49.1N	54.7E	128	S	123	0	0	1	1.1	4.3	4.4
36058	51.4N	86.0E	420	MS	122	1	1	25	2.3	4.4	5.0
36982	41.9N	78.2E	3635	S7	102	1	1	3	1.2	6.1	6.2
38565	40.6N	65.7E	485	MS	122	121	99	0	0.0	-0.5	0.5
38846	38.4N	70.0E	1437	S8	30	0	0	33	1.5	-5.1	5.3
40435	24.5N	44.4E	991	MS	61	1	2	2	1.0	7.8	7.9
40700	39.6N	47.9E	45	MS	115	0	0	2	1.0	-6.8	6.9
40713	37.4N	46.3E	1475	MS	120	1	1	0	0.6	13.6	13.6
40726	36.8N	45.7E	1384	MS	115	0	0	1	0.9	4.1	4.2
40741	36.5N	61.2E	235	MS	119	0	0	0	0.9	-5.0	5.1
40743	36.2N	57.7E	978	MS	120	3	3	94	1.0	4.3	4.4
40757	35.6N	53.4E	1171	MS	119	0	0	0	1.0	5.9	6.0
40780	33.6N	46.4E	1362	MS	111	0	0	0	0.7	4.8	4.9
41254	23.1N	57.6E	1755	S8	96	96	100	0			
44212	50.0N	92.1E	940	MS	119	1	1	7	2.1	4.4	4.9
44265	46.1N	91.5E	1186	MS	121	0	0	1	2.1	5.5	5.9
44416	28.6N	81.6E	720	MS	62	1	2	0	0.7	4.5	4.6
47022	40.8N	128.2E	1224	S	101	2	2	2	1.1	4.5	4.6
47678	33.1N	139.8E	79	MS	124	0	0	0	0.7	-9.3	9.3
48924	21.1N	101.5E	644	S	49	3	6	0	1.3	10.8	10.9
48925	20.7N	102.0E	550	S	47	1	2	2	1.4	-10.5	10.6
48938	19.2N	101.7E	326	MS	50	29	58	0	3.6	13.5	14.0
50727	47.2N	119.9E	1028	MS	123	1	1	1	1.1	5.5	5.6
50978	45.3N	131.0E	234	MS	123	0	0	100	0.6	-5.6	5.6
51053	48.1N	86.4E	534	M	118	0	0	25	2.4	4.5	5.1
51288	45.4N	90.5E	1651	S	123	0	0	4	1.5	-5.4	5.6
51334	44.6N	82.9E	321	M	115	0	0	53	2.5	8.0	8.4
51379	44.0N	89.6E	794	M	118	0	0	53	2.4	7.8	8.2
51495	43.2N	91.7E	874	M	118	5	4	5	2.0	10.6	10.8
51818	37.6N	78.3E	1376	M	115	0	0	50	2.4	5.9	6.4
52378	41.4N	102.4E	960	M	117	0	0	2	2.1	5.2	5.6

52866	36.6N	101.8E	2262	S	124	0	0	0	1.1	-4.5	4.6
53083	44.6N	114.2E	1183	M	118	0	0	0	2.6	6.1	6.6
53352	41.7N	110.4E	1377	M	117	0	0	0	2.8	5.7	6.4
53480	41.0N	113.1E	1416	M	118	0	0	0	2.6	5.7	6.3
53487	40.1N	113.3E	1069	M	116	0	0	10	2.3	4.5	5.1
53502	39.8N	105.8E	1143	M	117	0	0	3	2.0	4.9	5.3
53593	39.8N	114.6E	910	M	117	0	0	19	2.2	4.4	4.9
53646	38.2N	109.7E	1058	MS	124	0	0	100	0.6	-11.3	11.3
53863	37.0N	111.9E	750	M	117	0	0	0	1.8	4.0	4.4
54386	41.4N	128.2E	1018	M	116	0	0	38	2.6	5.3	5.9
56193	32.4N	104.5E	877	M	119	0	0	0	2.0	4.1	4.6
56287	30.0N	103.0E	629	M	119	0	0	0	1.6	5.0	5.2
56385	29.5N	103.3E	3049	S	120	0	0	0	1.9	-5.2	5.5
56462	29.0N	101.5E	2994	S	124	0	0	0	1.4	8.7	8.8
56768	25.0N	101.5E	1773	S	120	0	0	0	0.9	-5.2	5.3
57016	34.3N	107.1E	610	M	118	0	0	3	1.9	4.2	4.6
57816	26.6N	106.7E	1074	MS	124	117	94	0	0.3	-14.7	14.7
57922	25.8N	107.6E	971	M	120	0	0	0	1.1	4.0	4.1
59663	21.9N	112.0E	22	MS	123	0	0	100	0.8	-7.8	7.8

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80434	9.2N	66.0W	125	MS	90	3	3	1	1.4	-5.5	5.7
82181	2.0S	54.1W	146	MS	82	0	0	0	1.1	5.1	5.2
82704	7.6S	72.7W	170	MS	74	0	0	0	1.1	-5.0	5.1
83235	12.4S	46.4W	604	MS	91	0	0	0	0.7	6.4	6.4
83332	14.1S	46.4W	826	MS	90	10	11	0	0.7	13.5	13.5
83470	17.9S	50.9W	727	MS	91	2	2	0	0.7	-5.8	5.8
83531	18.6S	46.5W	940	MS	90	0	0	0	0.6	-6.2	6.2
83738	22.5S	44.5W	440	MS	90	10	11	1	0.8	-13.8	13.8
83836	25.5S	50.6W	837	MS	90	0	0	0	0.6	-5.1	5.1
84425	5.9S	76.1W	179	MS	25	0	0	0	1.5	4.6	4.8
84455	6.5S	76.4W	281	MS	84	0	0	0	1.1	6.0	6.1
84472	7.1S	78.5W	2620	S	57	0	0	0	1.1	-5.4	5.5
84474	7.2S	76.7W	350	S	23	1	4	4	1.0	8.9	9.0
84686	13.6S	72.0W	3248	S	118	0	0	0	0.7	-4.2	4.3
84688	13.7S	73.4W	3444	S	49	0	0	0	0.6	-12.2	12.2
84720	14.9S	75.0W	567	MS	57	0	0	0	0.7	4.1	4.2
84782	18.1S	70.3W	468	MS	97	0	0	1	1.3	6.6	6.7
85140	14.3S	67.4W	140	MS	60	2	3	0	1.4	7.0	7.1
85312	19.8S	63.9W	992	S	43	1	2	2	1.4	-12.0	12.1
85432	22.5S	68.9W	2320	S8	87	0	0	0	0.6	4.8	4.8

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71049	66.0N	91.8W	150	MS	121	121	100	0			
71094	66.6N	61.6W	393	MS	124	0	0	14	1.8	-5.3	5.6
71181	47.1N	55.3W	29	MS	124	0	0	0	1.3	-6.0	6.1
71408	47.4N	55.8W	35	MS	122	0	0	2	1.5	-6.0	6.2
71475	49.3N	124.8W	2	MS	123	0	0	0	1.1	-7.9	8.0
71506	67.0N	136.2W	720	MS	113	2	2	20	2.8	-5.9	6.5
71599	44.4N	65.2W	127	MS	124	0	0	0	1.1	-5.2	5.3
71747	48.8N	91.6W	424	MS	124	0	0	0	0.7	4.4	4.5
76055	31.0N	114.9W	440	MS	73	73	100	0			
76225	28.6N	106.1W	1435	MS	79	0	0	0	1.1	-4.3	4.4
76543	22.0N	98.8W	104	S	31	0	0	0	1.3	7.0	7.1
76658	19.2N	103.7W	494	MS	23	0	0	0	0.8	5.4	5.5
76762	17.5N	99.5W	1265	MS	68	1	1	0	0.9	5.3	5.4
76903	14.9N	92.3W	118	MS	68	0	0	0	0.9	5.5	5.6
78588	17.2N	87.5W	-308	M	124	116	94	0	0.6	0.1	0.6

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	21	0	0	0	1.1	10.6	10.7
94130	14.8S	131.9E	120	MS	123	0	0	0	1.1	5.6	5.7
96505	3.7N	115.7E	-9999	8	36	36	100	0			
97378	10.7S	123.1E	1	MS	51	44	86	0	4.2	-12.9	13.6
98851	6.1N	125.2E	14	S	108	10	9	100	0.7	-13.4	13.4

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	124	0	0	0	1.2	8.1	8.2
02151	66.5N	20.2E	275	MS	72	14	19	67	7.9	0.5	7.9
04272	60.7N	46.1W	32	MS	367	0	0	0	1.3	-4.1	4.3
06605	47.1N	7.1E	1599	S8	124	0	0	2	1.3	-4.9	5.1
06685	47.0N	9.1E	515	MS	124	0	0	2	1.4	7.3	7.4
08912	42.9N	0.8W	1434	MS	102	102	100	0			
08922	42.8N	0.2W	1660	MS	88	88	100	0			
10850	48.8N	10.7E	457	MS	372	0	0	0	0.6	-5.7	5.7
11116	47.5N	10.8E	870	MS	60	1	2	0	0.7	4.8	4.9
13269	44.3N	19.9E	176	MS	123	0	0	0	0.8	8.1	8.1
16538	40.1N	9.3E	1022	S	35	0	0	0	0.9	9.1	9.1
17203	38.9N	40.5E	1177	S8	123	0	0	0	1.3	5.8	5.9
17310	36.6N	32.0E	6	MS	90	57	63	0	1.9	-0.6	2.0
37018	44.1N	39.0E	95	MS	117	0	0	56	1.0	6.5	6.6

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	52	0	0	0	1.0	-5.5	5.6
89263	66.0S	66.1W	20	M	257	107	42	0	8.9	8.8	12.5
89264	71.4S	68.9W	780	S	215	0	0	0	1.0	8.3	8.4
89266	72.2S	60.2W	91	S	275	267	97	27	0.4	-14.3	14.3
89272	75.0S	70.8W	1395	S	274	274	100	0			
89327	73.2S	127.1W	230	S	261	69	26	0	3.0	1.8	3.5
89610	65.9S	113.1E	90	S	263	0	0	0	0.9	-8.3	8.3
89614	66.6S	111.2E	500	S	269	269	100	0			
89744	74.0S	43.1E	3353	S	290	0	0	0	0.5	7.1	7.1

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	3237	1	35	1.9	0.0	3225	0	35	0	8.0	0.8
AAL	5552	1	34	1.9	0.0	5424	0	34	0	7.5	0.6
AAR	1546	1	7	2.0	-0.7	1539	0	8	0	8.3	0.1
ACA	2433	1	11	1.8	-0.2	2341	0	11	0	8.0	0.4
ACI	104	0	10	1.3	0.5	107	0	10	0	6.7	0.4
AEA	935	1	3	1.8	0.0	598	1	3	0	8.0	0.3
AEL	622	1	7	1.9	-0.2	510	0	8	0	8.0	0.5
AEW	52	0	2	2.1	-0.8	52	0	6	0	9.4	2.7
AFL	615	0	5	1.9	0.5	544	1	4	0	6.8	0.7
AFR	1705	0	6	1.5	0.0	1385	0	8	0	8.2	0.6
AJM	374	1	4	1.9	-0.5	340	0	4	0	7.8	0.1
AJX	363	0	7	1.7	0.0	365	1	7	0	8.2	0.6
AMM	84	1	4	1.2	0.1	64	0	5	0	6.9	1.6
AMT	1631	0	38	1.6	-0.1	1633	0	39	0	7.3	0.9
AMX	315	3	11	2.0	0.2	260	0	10	0	12.3	0.0
ANA	89	0	6	2.1	0.4	91	2	7	0	9.1	0.4
ANZ	5422	0	25	1.3	0.3	5408	0	25	0	6.9	0.4
ARG	37	3	49	2.8	1.3	32	3	41	0	12.5	-0.4
ATN	168	1	100	3.7	-1.6	166	0	14	0	9.7	1.1
AVA	264	1	9	2.4	0.9	192	0	8	0	11.7	0.2
AVN	182	0	45	0.9	0.1	181	0	45	0	5.5	-0.3
AZA	393	2	7	2.1	0.3	353	0	6	0	9.4	0.2
BAL	352	0	7	1.6	0.1	308	0	8	0	9.0	1.0
BAW	913	1	14	1.8	-0.2	848	0	15	0	8.4	0.9
BBR	174	1	8	2.3	0.5	122	0	3	0	10.1	1.6
BHP	54	0	0	1.2	-0.4	46	0	0	0	5.1	1.1
BMI	28	0	7	1.5	0.3	28	0	7	0	6.4	0.1
BPA	573	1	100	2.1	-0.1	505	0	8	0	9.2	0.3
BSK	88	6	27	2.0	0.1	86	0	29	0	12.9	-1.6
BWA	329	1	5	1.9	-0.1	256	0	4	0	7.6	0.7
CAL	61	0	2	2.2	-0.4	61	0	5	0	9.1	-0.2
CCA	280	2	17	2.7	-0.5	288	0	100	0	13.2	-1.1
CES	322	1	9	2.2	-0.3	322	1	10	0	9.2	1.3
CFC	70	0	9	1.7	-0.4	71	0	10	0	7.6	1.3
CFG	917	0	3	1.5	-0.1	789	0	3	0	7.4	0.5
CGL	22	0	0	1.3	0.0	22	0	0	0	6.3	0.3
CKK	198	1	7	2.1	0.8	204	0	7	0	8.9	0.6
CKS	349	2	28	1.8	0.8	334	0	28	0	9.7	0.1
CLX	362	1	5	1.7	-0.6	282	0	6	0	8.4	0.4
COA	246	0	27	1.9	0.0	218	0	27	0	9.5	1.1
CPA	26	0	19	0.9	0.7	24	0	17	0	6.7	1.7
CRL	1035	1	3	1.7	0.4	805	0	3	0	7.6	1.2
CSA	20	0	5	1.9	-1.1	20	0	0	0	5.9	-0.5
CSN	109	2	9	2.2	0.3	109	0	7	0	10.4	1.5
CUB	188	0	4	2.1	-0.2	165	1	8	0	10.2	1.0
DAL	2655	1	33	1.6	-0.2	2643	0	35	0	8.2	0.7
DCE	168	1	12	1.8	-0.9	161	0	12	0	7.5	1.2
DCS	45	7	11	2.2	-0.7	46	0	7	0	8.2	-0.1
DHL	142	2	100	6.6	-6.4	135	0	100	0	12.4	3.0
DLH	744	0	13	1.5	-0.2	701	0	13	0	6.5	1.3
EDW	130	1	8	1.7	-0.3	118	0	7	0	8.6	0.4
EEZ	127	3	8	2.0	0.1	108	0	6	0	7.6	1.1
EIA	287	1	100	2.7	1.0	289	1	100	0	17.0	4.6
ELY	192	0	4	1.8	0.0	187	1	3	0	7.2	0.5
ETH	21	0	5	0.9	0.1	21	0	5	0	3.9	0.2
EVA	186	1	8	2.0	-0.6	208	1	10	0	8.2	-0.1
FCA	76	0	4	1.6	0.3	64	0	6	0	11.3	0.2
FDX	2005	0	33	1.5	0.2	1984	0	34	0	7.7	0.6
FIN	255	0	4	1.4	0.1	246	0	5	0	6.2	0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FJI	747	3	37	1.7	0.8	737	0	37	0	7.5	0.3
FOM	719	0	26	1.4	0.3	719	0	26	0	7.5	0.3
FWI	339	2	5	1.8	-0.3	313	1	4	0	8.1	0.4
GCO	242	0	10	1.6	-0.1	250	0	11	0	9.0	1.8
GHA	94	1	3	2.1	-0.8	77	1	4	0	10.1	1.7
GRL	77	0	3	1.9	0.6	76	0	0	0	4.3	1.0
GTI	129	5	50	1.7	-0.2	130	0	10	0	6.0	0.9
HAL	4440	0	36	1.7	-0.2	4418	0	36	0	8.0	0.9
HLN	325	1	21	2.0	0.1	304	1	20	0	8.2	0.9
HRH	189	0	50	1.1	0.0	189	0	50	0	9.5	0.5
IBE	2895	1	6	1.7	0.3	2114	1	8	0	8.4	0.4
ICE	843	0	9	1.8	-0.2	792	0	6	0	8.5	0.7
IWD	175	1	5	1.9	-0.1	137	0	4	0	7.8	0.7
JAL	3055	0	5	1.7	0.2	3032	0	6	0	8.0	0.3
JAZ	729	0	4	1.6	0.3	736	1	6	0	8.2	0.7
JBU	64	0	0	1.3	0.2	64	0	0	0	4.9	0.0
KAI	45	2	33	2.2	1.5	40	0	30	0	5.5	1.5
KAL	2574	0	8	1.8	-0.2	2556	0	9	0	8.0	0.3
KLM	1487	0	4	1.7	0.0	1276	0	5	0	7.9	0.7
LAN	450	0	5	1.7	-0.1	448	0	4	0	5.8	1.2
LAP	98	0	53	3.0	1.1	95	0	45	0	6.6	0.2
LDA	44	2	39	4.4	2.9	40	0	3	0	6.8	-0.4
LDI	525	0	4	1.7	-0.1	401	1	4	0	7.4	0.5
LNE	98	0	8	1.9	-0.1	65	0	11	0	12.5	0.1
LOB	52	4	33	3.0	-1.5	50	0	30	0	10.3	1.2
LOT	130	1	2	1.7	-1.1	128	0	2	0	5.9	0.2
LTU	783	1	5	1.8	-0.1	658	0	5	0	8.3	0.8
MAS	206	1	13	2.7	0.7	204	0	7	0	8.8	-0.3
MON	68	0	21	3.3	1.8	61	0	0	0	5.3	0.3
MPD	261	1	4	1.9	0.3	191	0	5	0	7.7	1.1
MPH	518	0	4	2.0	-1.0	475	0	4	0	8.1	0.4
MXA	93	6	19	2.9	0.7	92	1	21	0	16.4	-1.3
MYT	275	3	8	2.2	0.7	234	0	4	0	7.5	0.8
NAO	358	0	22	2.0	-0.6	360	1	23	0	8.1	1.2
NCA	757	0	3	1.7	0.1	594	1	6	0	8.2	0.5
NWA	7603	1	10	1.8	-0.1	7581	0	11	0	8.1	0.6
NZL	2989	0	13	1.0	-0.1	2989	0	14	0	6.1	0.3
OAE	702	0	30	1.5	-0.3	706	0	40	0	12.2	2.8
PAC	354	1	12	1.7	-0.2	354	0	12	0	9.0	0.4
PAL	1721	0	12	1.7	0.0	1679	0	15	0	9.5	0.5
PAO	353	0	51	1.1	0.2	354	0	52	0	7.1	1.0
PLM	177	1	5	2.0	1.0	105	0	10	0	12.4	0.1
PUA	28	0	32	2.0	0.0	25	0	40	0	11.8	3.7
QFA	3677	0	39	1.2	0.3	3680	0	39	0	6.2	0.4
QQA	86	5	52	1.6	0.4	86	0	47	0	5.1	-0.4
RAM	225	0	6	2.3	-0.1	151	1	11	0	12.5	0.8
RCH	250	3	100	3.9	-1.1	213	0	100	0	11.8	2.4
RJA	47	0	4	1.6	-0.3	50	0	6	0	9.5	1.2
RRR	21	5	19	1.9	-0.1	20	0	15	0	8.5	2.8
RZO	296	1	4	1.8	-0.4	178	1	6	0	9.1	0.6
SAA	377	1	5	1.8	-0.9	323	1	7	0	9.8	0.3
SEU	567	1	4	1.9	0.0	487	0	4	0	7.8	0.2
SHE	22	0	0	1.8	1.0	21	0	10	0	10.1	1.1
SIA	366	0	2	1.3	0.4	367	0	2	0	5.7	-0.1
SLR	185	1	10	1.6	-0.4	180	1	11	0	7.8	0.9
SQC	50	0	2	1.3	0.7	50	0	2	0	4.3	-0.2
SVA	23	0	9	2.6	-0.2	22	0	0	0	7.3	-0.3
TAG	64	0	44	2.6	0.6	62	0	44	0	7.7	2.0
TAM	35	6	40	2.6	1.2	33	0	36	0	14.6	-1.1

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAP	514	1	6	2.0	-0.6	276	1	7	0	8.6	0.8
TCX	50	2	6	1.5	0.6	47	0	0	0	5.4	0.7
THA	174	0	5	1.8	0.1	174	0	5	0	7.7	0.5
THT	179	2	32	1.7	0.2	173	1	31	0	9.8	1.1
TPA	45	0	2	1.4	0.2	36	0	3	0	7.3	0.5
UAE	552	0	7	1.2	0.4	553	0	8	0	5.8	0.5
UAL	131856	0	92	1.3	-0.4	132007	0	92	0	5.4	0.6
UPS	1810	0	52	1.6	-0.2	1790	0	53	0	7.5	0.4
USA	191	1	3	1.8	-0.2	174	1	5	0	7.6	0.7
VHF	25	0	0	0.9	0.0	25	0	0	0	4.3	0.4
VIR	190	2	3	1.5	-0.2	172	0	2	0	7.4	1.1
VRG	121	5	36	2.4	0.7	117	1	100	0	10.8	1.3
VVJ	47	0	30	1.2	0.3	52	0	35	0	9.6	-0.1
VVR	29	0	28	2.9	0.8	29	0	24	0	8.2	-0.4
WOA	505	2	13	1.8	0.1	480	0	14	0	8.5	1.3
XLA	186	1	4	1.7	0.1	178	0	4	0	8.7	0.6
YSS	61	0	5	1.9	-0.1	52	0	6	0	9.6	0.2

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	40091	1	10	1.2	0.6	40098	0	9	0	5.4	0.5
EU	174455	0	23	1.3	0.2	174455	0	22	0	5.0	0.6
HL	30	0	7	1.5	-0.3	31	0	6	0	5.9	1.2
KL	1937	0	1	1.2	0.4	1937	0	1	0	6.4	1.0
LN	46	2	28	2.7	-0.3	48	0	25	0	10.6	0.2
MK	2596	0	6	1.6	1.1	2557	0	6	0	6.6	1.2
SA	4580	0	43	1.7	1.2	4465	0	11	0	6.0	0.7
TN	78	0	26	1.9	0.9	79	0	28	0	8.2	2.0

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	1371	1	31	2.2	0.3	1380	0	30	0	8.2	0.8
US ACARS	898357	0	62	1.4	0.2	898344	0	62	0	5.5	0.7

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:1000.0 – 300.1 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

IDENT.	N.REP.	TEMPERATURE PG	PR	RMS	BIAS	N.REP.	PG	WIND PR	PC	RMS	BIAS
AAL	194	2	40	2.0	-0.6	190	1	40	0	9.2	1.8
AFR	75	0	8	1.1	0.1	67	0	7	0	8.9	-0.1
AMT	48	4	29	1.3	0.1	44	0	34	0	8.7	0.2
ANZ	186	0	21	1.3	0.0	187	0	20	0	4.7	0.0
CFC	51	0	10	2.2	0.2	50	0	14	0	9.6	1.0
CFG	33	0	3	1.3	-0.2	28	0	4	0	7.6	-0.5
CKS	40	3	28	2.3	0.7	42	0	17	0	10.3	1.0
CRL	38	0	0	1.6	0.8	34	0	3	0	6.9	-1.7
DAL	241	1	35	1.3	0.0	243	0	35	0	9.0	0.1
DLH	167	0	14	1.5	-0.1	172	0	14	0	6.4	0.8
EVA	20	5	35	0.7	-0.3	21	0	29	0	8.9	-0.1
FDX	499	0	23	1.4	0.1	501	0	25	0	8.0	0.6
FIN	30	0	10	1.8	0.0	24	0	4	0	7.2	-0.7
FOM	20	5	45	1.9	0.5	20	0	40	0	7.4	2.3
GAF	23	0	0	0.9	0.3	21	0	0	0	6.7	0.3
GCO	66	0	6	1.6	-0.2	68	0	26	0	15.3	3.2
GHA	26	0	15	1.5	-0.5	24	0	29	0	14.1	2.7
GTI	31	6	87	3.0	0.0	31	0	0	0	6.2	0.5
HAL	295	3	39	1.8	-0.5	293	0	38	0	8.0	0.9
IBE	38	5	5	1.4	0.7	36	0	3	0	9.9	-0.2
ICE	38	0	0	2.2	-0.9	37	3	8	0	10.2	0.9
JAL	156	0	12	1.7	0.2	157	0	10	0	7.8	0.3
JAZ	56	0	13	1.3	0.1	56	0	14	0	6.6	0.6
JKK	40	0	40	1.1	0.2	40	0	48	0	11.6	0.2
KAL	39	0	8	2.0	-0.3	38	0	11	0	8.7	1.8
KIW	43	7	47	3.1	0.0	44	0	39	0	5.1	-0.7
KLM	40	0	3	1.2	0.2	32	0	3	0	6.8	1.5
MPH	85	0	4	2.1	-1.0	80	0	3	0	8.0	0.9
MYT	32	6	25	2.7	1.6	33	0	18	0	10.8	-1.1
NCA	71	0	4	1.5	0.0	62	0	8	0	8.3	-0.8
NWA	291	1	8	1.5	0.2	289	0	9	0	7.8	0.2
NZL	18924	0	56	1.5	0.3	18923	0	56	0	5.4	0.5
OAE	43	0	16	1.3	-0.1	41	0	32	0	14.2	-0.7
PAL	26	0	23	1.1	-0.6	22	0	27	0	7.2	2.2
QFA	271	0	36	1.9	0.3	273	0	35	0	5.6	0.4
RCH	25	0	100	3.8	-1.5	25	0	100	0	10.5	-0.8
RRR	57	0	12	2.9	1.3	56	0	16	0	12.1	2.0
SAA	58	0	2	1.7	-1.0	56	0	0	0	4.7	-0.8
SIA	63	0	0	1.5	0.6	64	0	2	0	4.3	0.5
SKI	57	4	61	3.6	-1.1	48	4	35	0	18.8	-0.7
UAE	78	0	3	1.0	0.7	79	0	3	0	3.6	1.0
UAL	240698	0	97	1.2	-0.1	240461	0	97	0	4.4	0.2
UPS	185	2	51	1.6	-0.4	179	1	53	0	7.0	0.5
VVP	33	6	55	3.5	2.2	35	0	34	0	8.1	-0.6
WOA	170	0	6	1.4	0.0	168	0	15	0	13.5	3.1

IDENT.	N.REP.	TEMPERATURE PG	PR	RMS	BIAS	N.REP.	PG	WIND PR	PC	RMS	BIAS
AU	29227	0	50	1.3	0.2	29280	0	50	0	4.3	0.0
EU	618735	0	69	1.0	0.2	618601	0	68	0	4.2	0.0
KL	1086	0	56	2.0	-0.6	1086	0	56	0	5.0	0.0
MK	1722	0	56	1.5	0.7	1693	0	55	0	4.7	0.9
SA	3033	0	70	1.7	0.5	2936	0	60	0	4.7	0.0

IDENT.	N.REP.	TEMPERATURE PG	PR	RMS	BIAS	N.REP.	PG	WIND PR	PC	RMS	BIAS
US ACARS	1675852	0	77	1.2	0.3	1671562	0	77	0	4.3	0.2

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 43217

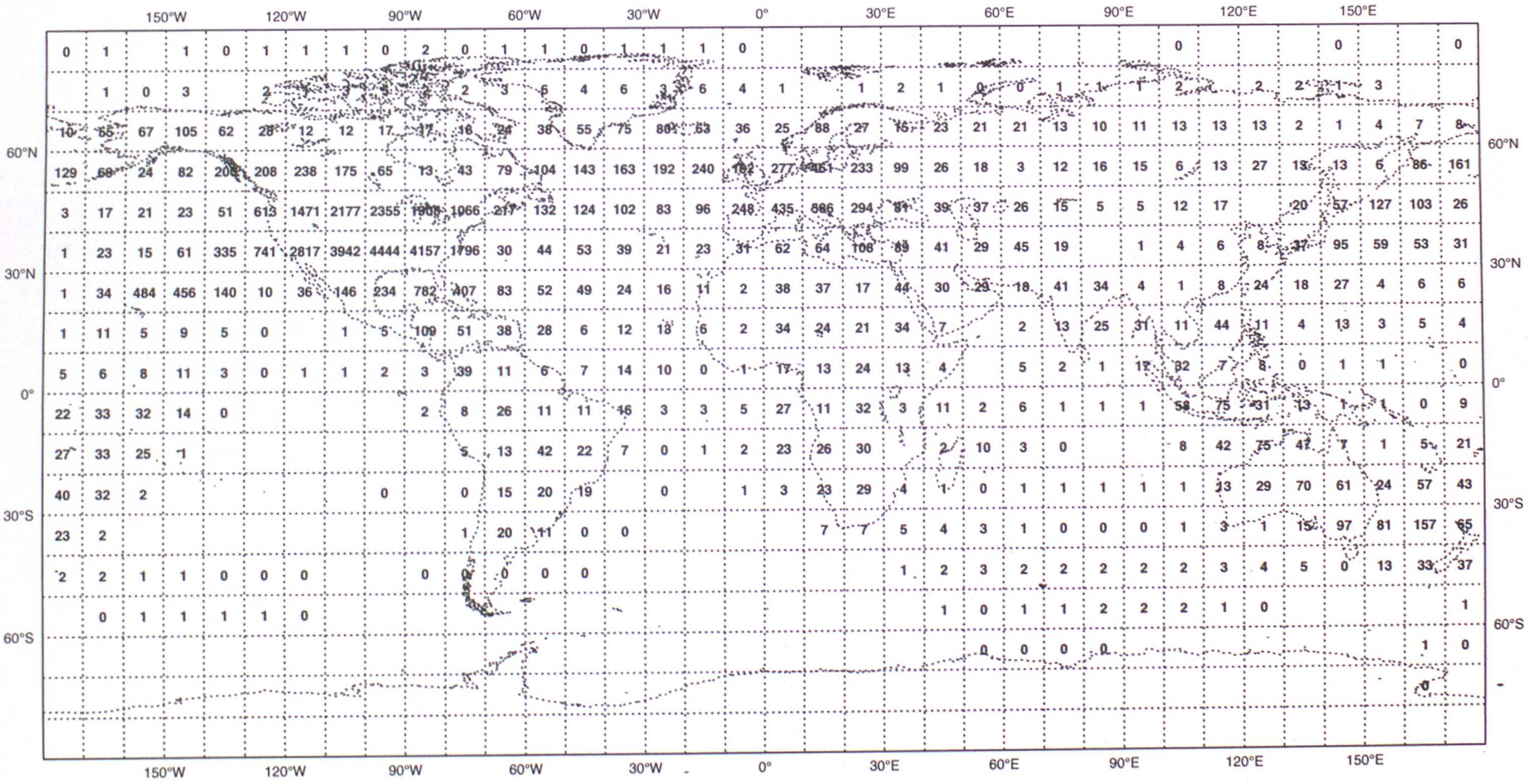

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 83505

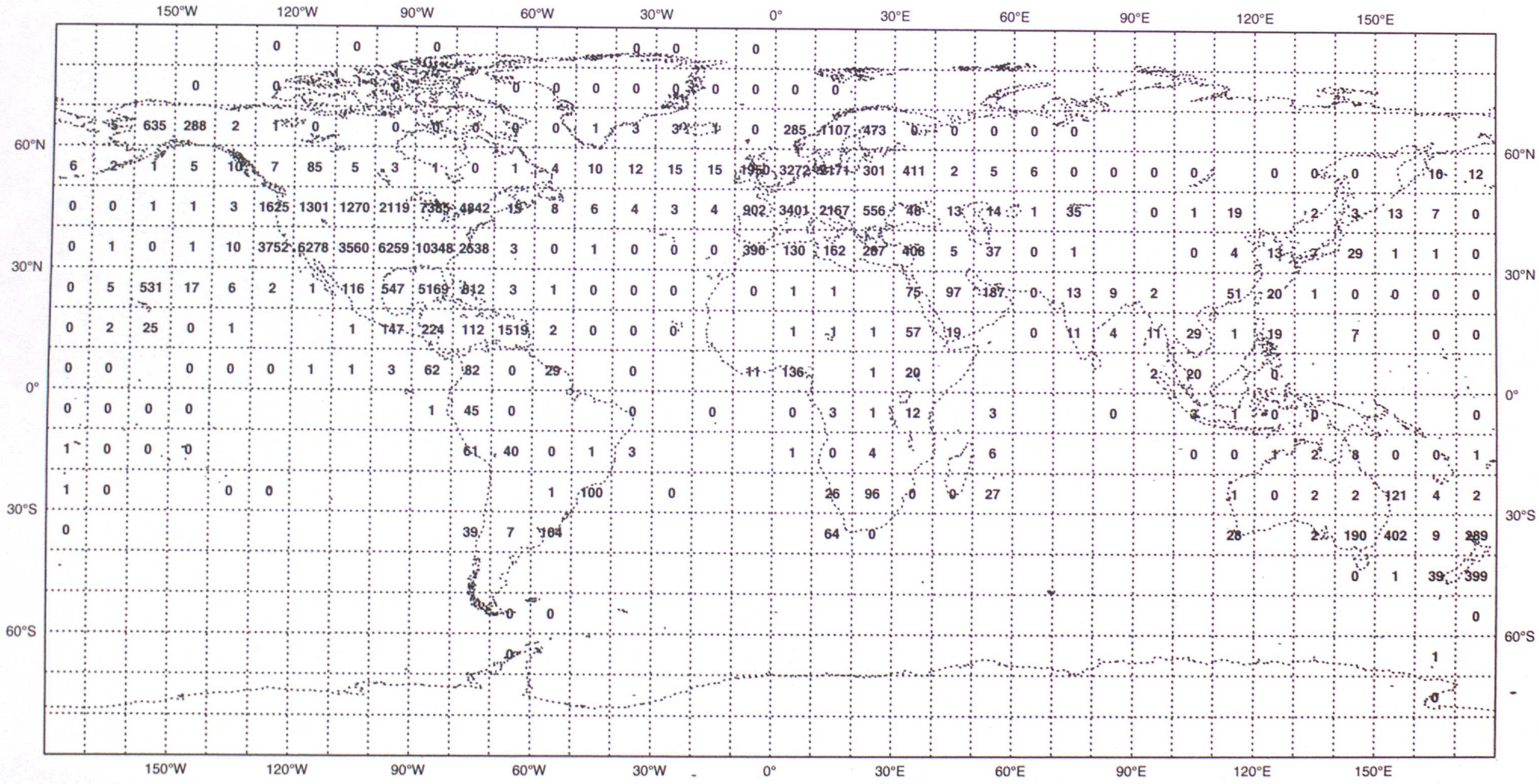

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0
635 288 2 1 0 0 0 0 0 0 1 3 3 1 0 285 1107 473 0 0 0 0 0
6 2 1 5 10 7 85 5 3 1 0 1 4 10 12 15 15 1950 3272 4171 301 411 2 5 6 0 0 0 0 0 0 0 16 12
0 0 1 1 3 1625 1301 1270 2119 7385 4842 15 8 6 4 3 4 902 3401 2167 556 46 13 14 1 35 0 1 19 2 3 13 7 0
0 1 0 1 10 3752 6278 3560 6259 10348 2638 3 0 1 0 0 0 390 130 162 287 408 5 37 0 1 0 4 13 3 29 1 1 0
0 5 531 17 6 2 1 116 547 5169 812 3 1 0 0 0 0 1 1 75 97 187 0 13 9 2 51 20 1 0 0 0 0
0 2 25 0 1 1 147 224 112 1519 2 0 0 0 1 1 1 57 19 0 11 4 11 29 1 19 7 0 0
0 0 0 0 0 1 1 3 62 82 0 29 0 11 136 1 20 2 20 0
0 0 0 0 1 45 0 0 0 0 3 1 12 3 0 3 1 0 0 0
1 0 0 0 61 40 0 1 3 1 0 4 6 0 0 1 2 8 0 0 1
1 0 0 0 1 100 0 26 96 0 0 27 1 0 2 2 121 4 2
0 39 7 164 64 0 28 2 190 402 9 289
0 1 39 399
0 0 0
1
0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

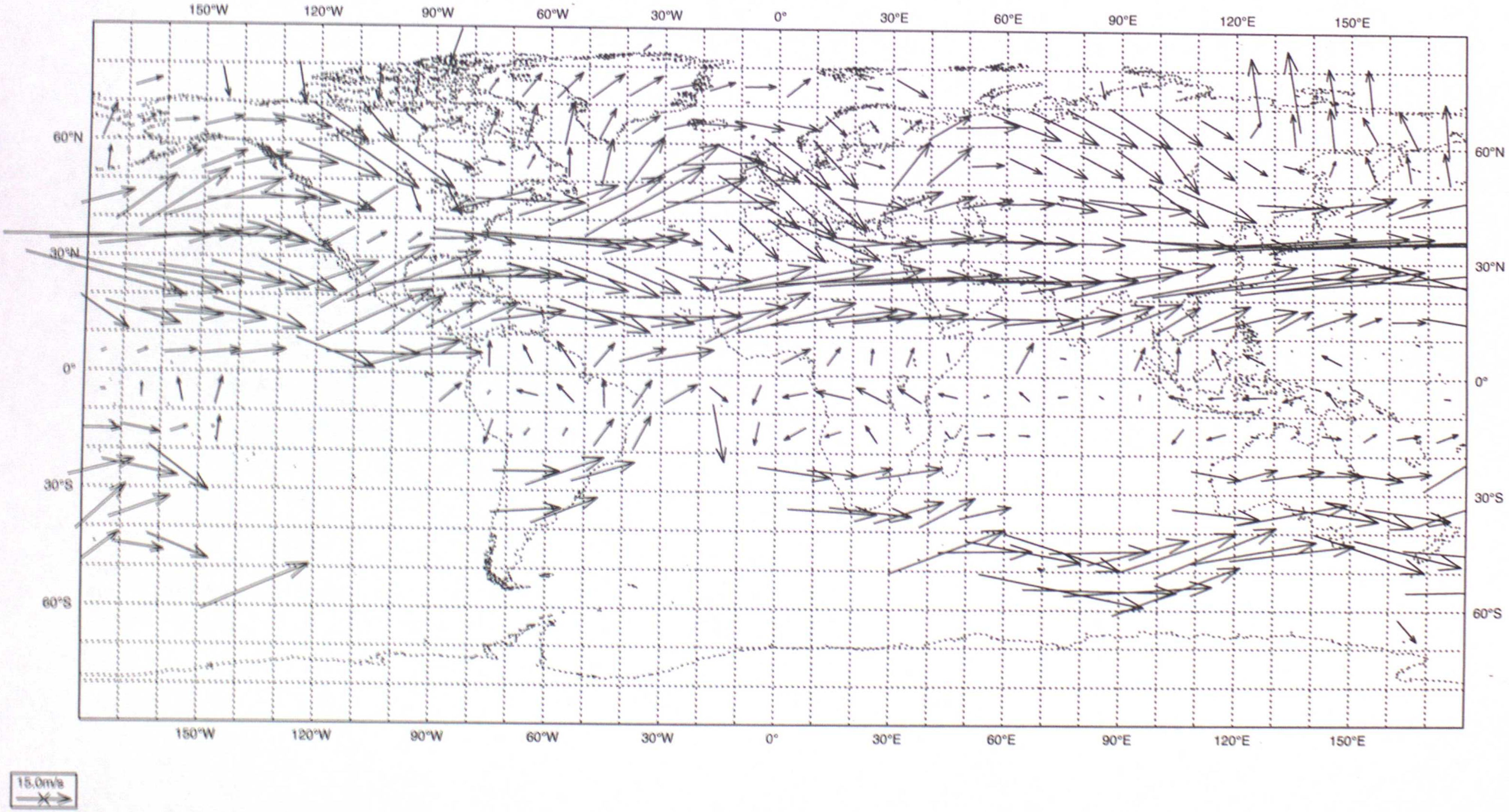

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

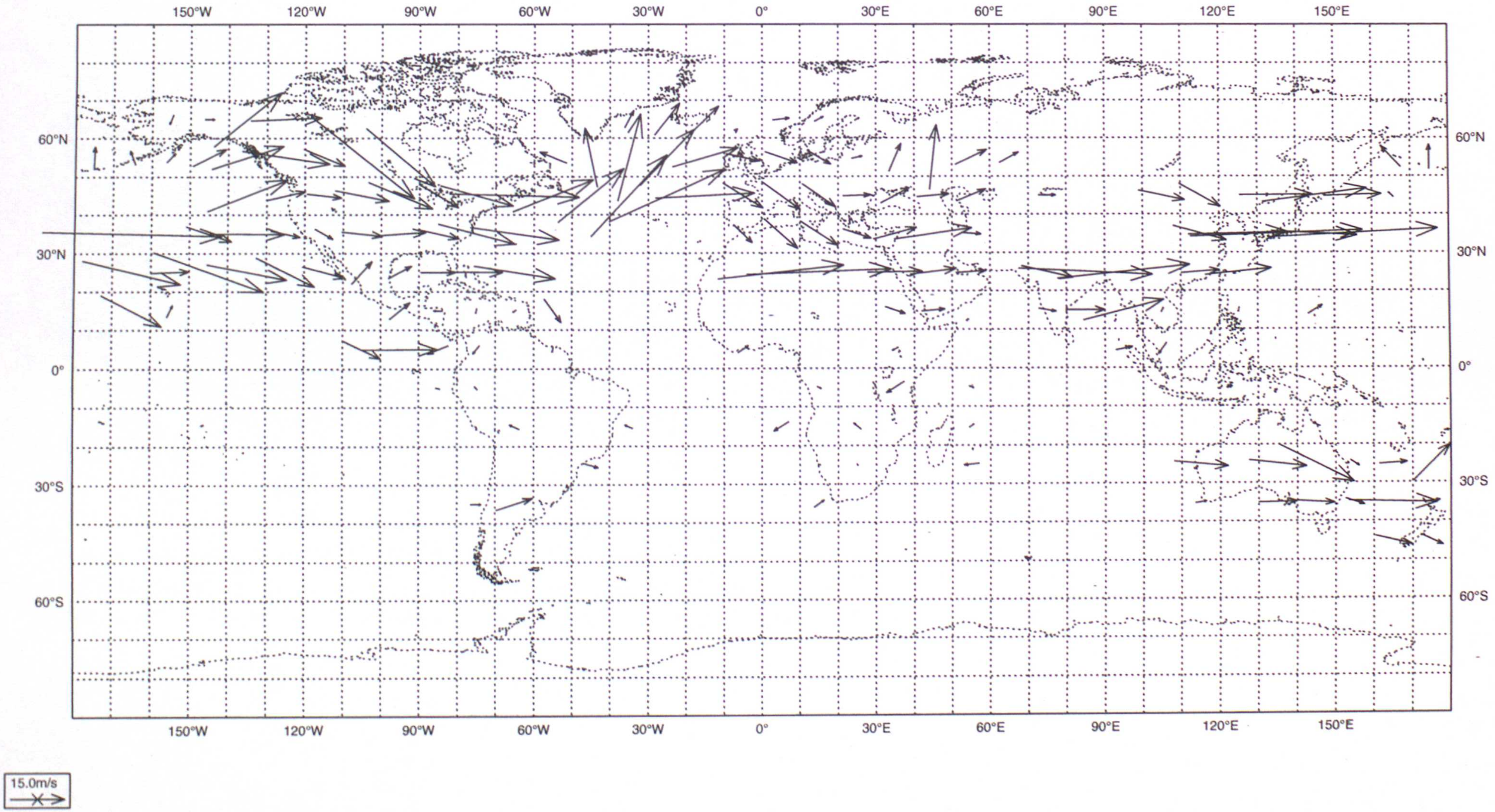

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

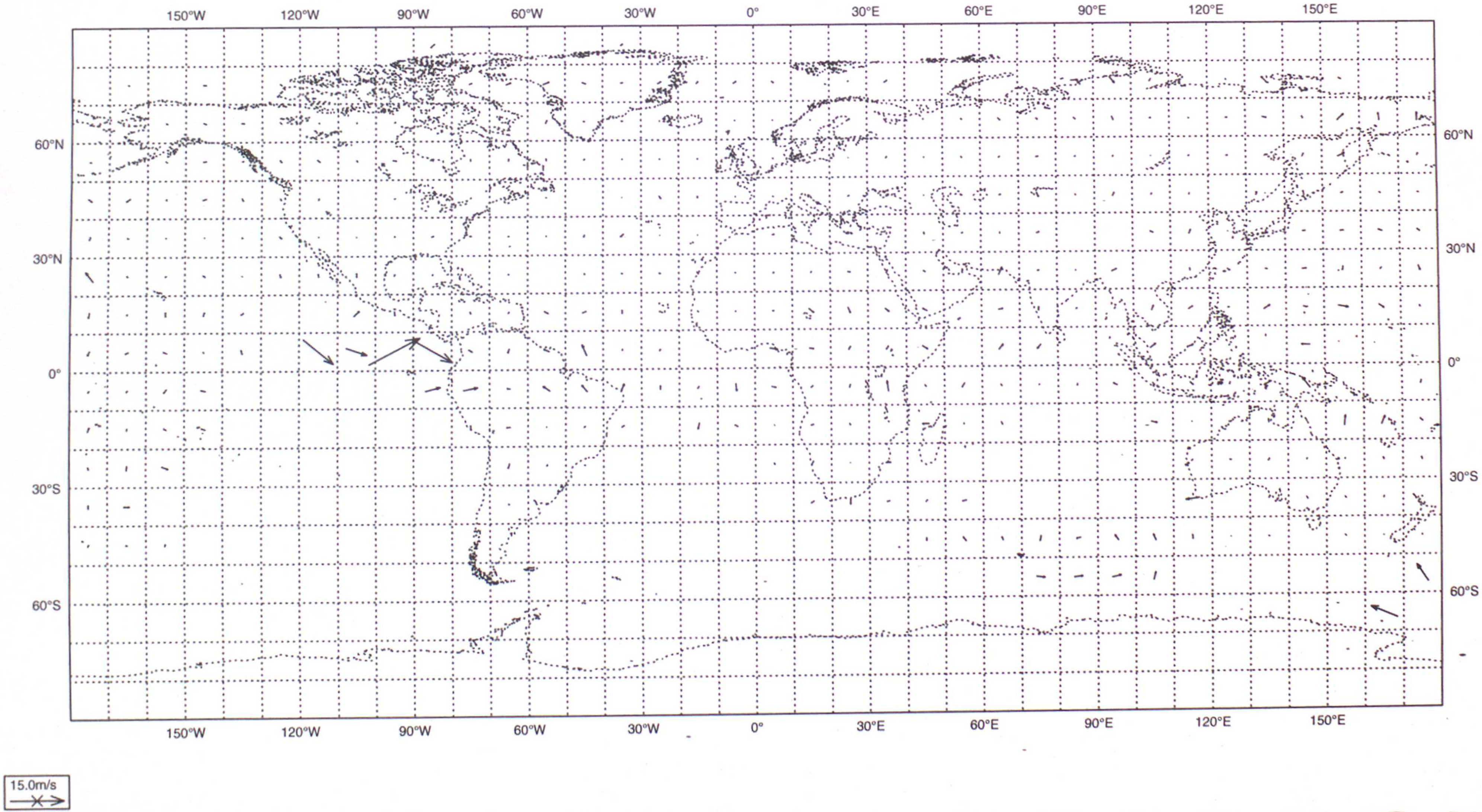

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

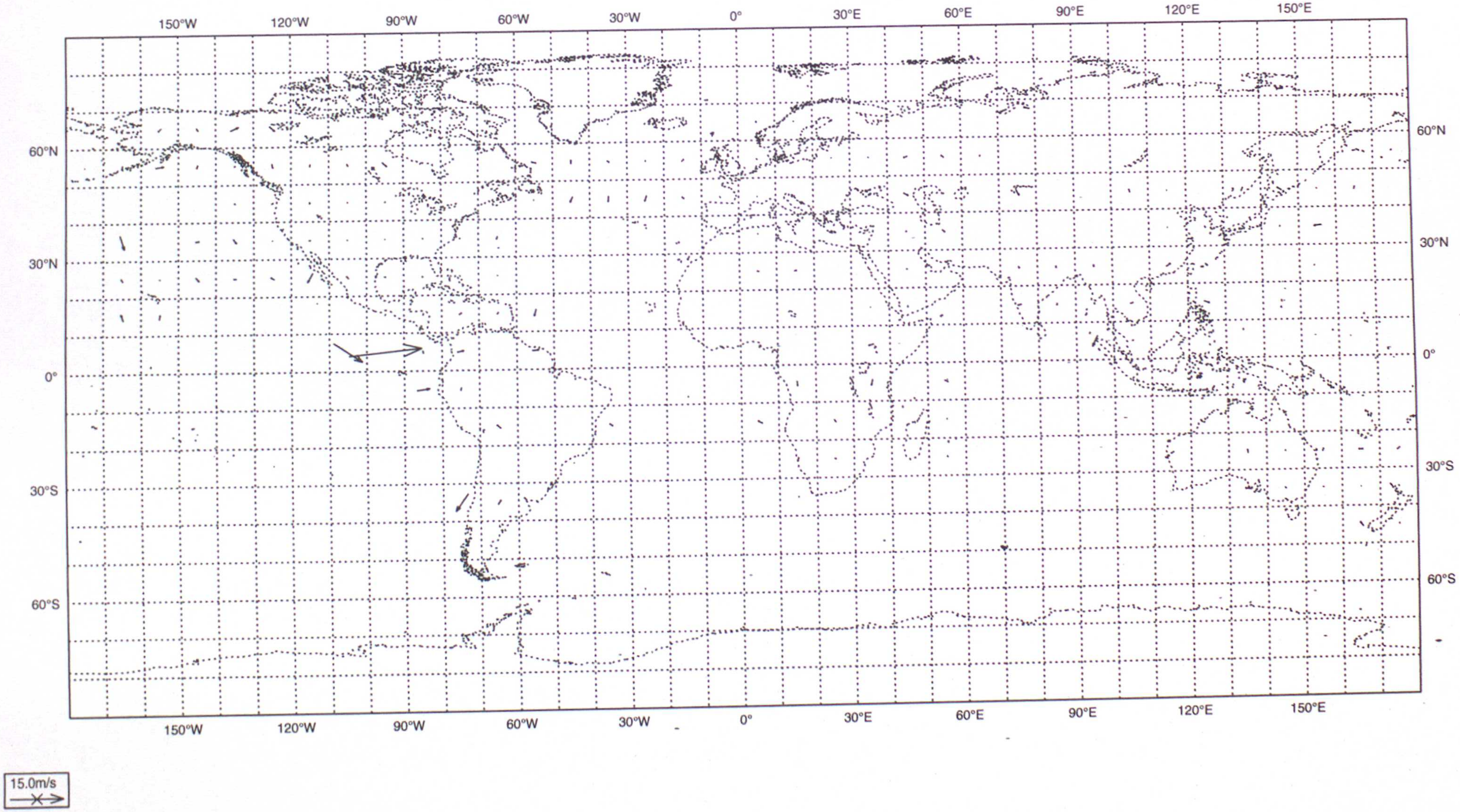

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

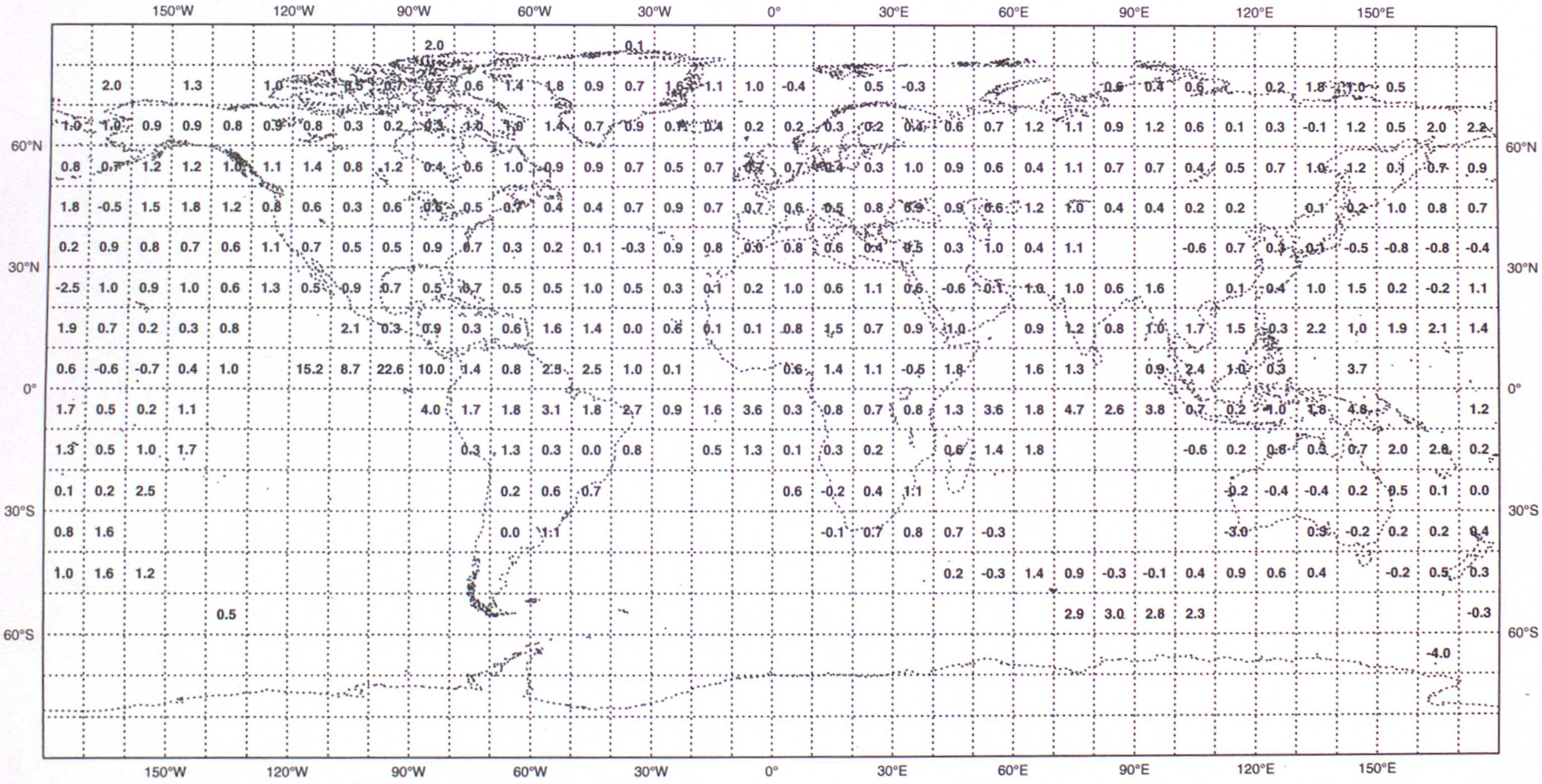

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.0 0.1
2.0 1.3 1.0 0.5 0.7 0.7 0.6 1.4 1.8 0.9 0.7 1.6 1.1 1.0 -0.4 0.5 -0.3 0.6 0.4 0.6 0.2 1.8 1.0 0.5
1.0 1.0 0.9 0.9 0.8 0.9 0.8 0.3 0.2 0.3 1.0 1.0 1.4 0.7 0.9 0.9 0.4 0.2 0.2 0.3 0.2 0.4 0.6 0.7 1.2 1.1 0.9 1.2 0.6 0.1 0.3 -0.1 1.2 0.5 2.0 2.2
0.8 0.7 1.2 1.2 1.0 1.1 1.4 0.8 1.2 0.4 0.6 1.0 0.9 0.9 0.7 0.5 0.7 0.7 0.7 0.4 0.3 1.0 0.9 0.6 0.4 1.1 0.7 0.7 0.4 0.5 0.7 1.0 1.2 0.1 0.7 0.9
1.8 -0.5 1.5 1.8 1.2 0.8 0.6 0.3 0.6 0.5 0.5 0.7 0.4 0.4 0.7 0.9 0.7 0.7 0.6 0.5 0.8 0.9 0.9 0.6 1.2 1.0 0.4 0.4 0.2 0.2 0.1 0.2 1.0 0.8 0.7
0.2 0.9 0.8 0.7 0.6 1.1 0.7 0.5 0.5 0.9 0.7 0.3 0.2 0.1 -0.3 0.9 0.8 0.0 0.8 0.6 0.4 0.5 0.3 1.0 0.4 1.1 -0.6 0.7 0.3 0.1 -0.5 -0.8 -0.8 -0.4
-2.5 1.0 0.9 1.0 0.6 1.3 0.5 0.9 0.7 0.5 0.7 0.5 0.5 1.0 0.5 0.3 0.1 0.2 1.0 0.6 1.1 0.6 -0.6 0.1 1.0 1.0 0.6 1.6 0.1 0.4 1.0 1.5 0.2 -0.2 1.1
1.9 0.7 0.2 0.3 0.8 2.1 0.3 0.9 0.3 0.6 1.6 1.4 0.0 0.6 0.1 0.1 0.8 1.5 0.7 0.9 1.0 0.9 1.2 0.8 1.0 1.7 1.5 0.3 2.2 1.0 1.9 2.1 1.4
0.6 -0.6 -0.7 0.4 1.0 15.2 8.7 22.6 10.0 1.4 0.8 2.5 2.5 1.0 0.1 0.6 1.4 1.1 -0.5 1.8 1.6 1.3 0.9 2.4 1.0 0.3 3.7
1.7 0.5 0.2 1.1 4.0 1.7 1.8 3.1 1.8 2.7 0.9 1.6 3.6 0.3 0.8 0.7 0.8 1.3 3.6 1.8 4.7 2.6 3.8 0.7 0.2 1.0 1.8 4.8 1.2
1.3 0.5 1.0 1.7 0.3 1.3 0.3 0.0 0.8 0.5 1.3 0.1 0.3 0.2 0.6 1.4 1.8 -0.6 0.2 0.8 0.3 0.7 2.0 2.8 0.2
0.1 0.2 2.5 0.2 0.6 0.7 0.6 -0.2 0.4 1.1 -0.2 -0.4 -0.4 0.2 0.5 0.1 0.0
0.8 1.6 0.0 1.1 -0.1 0.7 0.8 0.7 -0.3 -3.0 0.3 -0.2 0.2 0.2 0.4
1.0 1.6 1.2 0.2 -0.3 1.4 0.9 -0.3 -0.1 0.4 0.9 0.6 0.4 -0.2 0.5 0.3
0.5 2.9 3.0 2.8 2.3 -0.3
-4.0

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

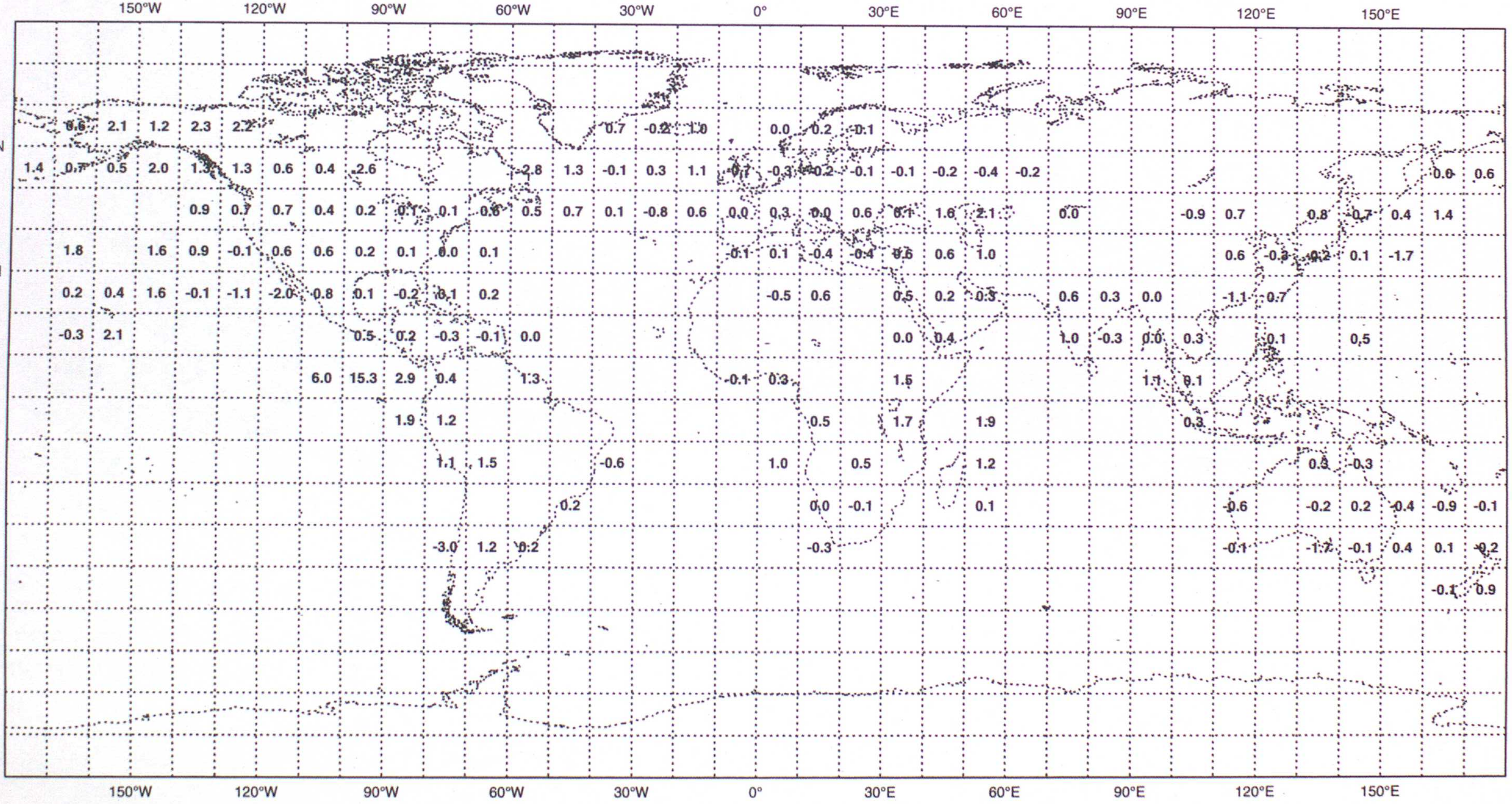

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.6 2.1 1.2 2.3 2.2 0.7 -0.2 1.0 0.0 0.2 -0.1
1.4 0.7 0.5 2.0 1.3 1.3 0.6 0.4 2.6 -2.8 1.3 -0.1 0.3 1.1 -0.1 -0.3 -0.2 -0.1 -0.1 -0.2 -0.4 -0.2 0.6 0.6
0.9 0.7 0.7 0.4 0.2 0.1 0.1 0.6 0.5 0.7 0.1 -0.8 0.6 0.0 0.3 0.0 0.6 0.1 1.6 2.1 0.0 -0.9 0.7 0.8 -0.7 0.4 1.4
1.8 1.6 0.9 -0.1 0.6 0.6 0.2 0.1 0.0 0.1 -0.1 0.1 -0.4 -0.4 0.6 0.6 1.0 0.6 -0.3 -0.2 0.1 -1.7
0.2 0.4 1.6 -0.1 -1.1 -2.0 -0.8 0.1 -0.2 0.1 0.2 -0.5 0.6 0.5 0.2 0.3 0.6 0.3 0.0 -1.1 0.7
-0.3 2.1 0.5 0.2 -0.3 -0.1 0.0 0.0 0.4 1.0 -0.3 0.0 0.3 0.1 0.5
6.0 15.3 2.9 0.4 1.3 -0.1 0.3 1.5 1.1 0.1
1.9 1.2 0.5 1.7 1.9 0.3
1.1 1.5 -0.6 1.0 0.5 1.2 0.3 -0.3
0.2 0.0 -0.1 0.1 0.6 -0.2 0.2 0.4 -0.9 -0.1
-3.0 1.2 0.2 -0.3 -0.1 -1.7 -0.1 0.4 0.1 0.2
-0.1 0.9

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

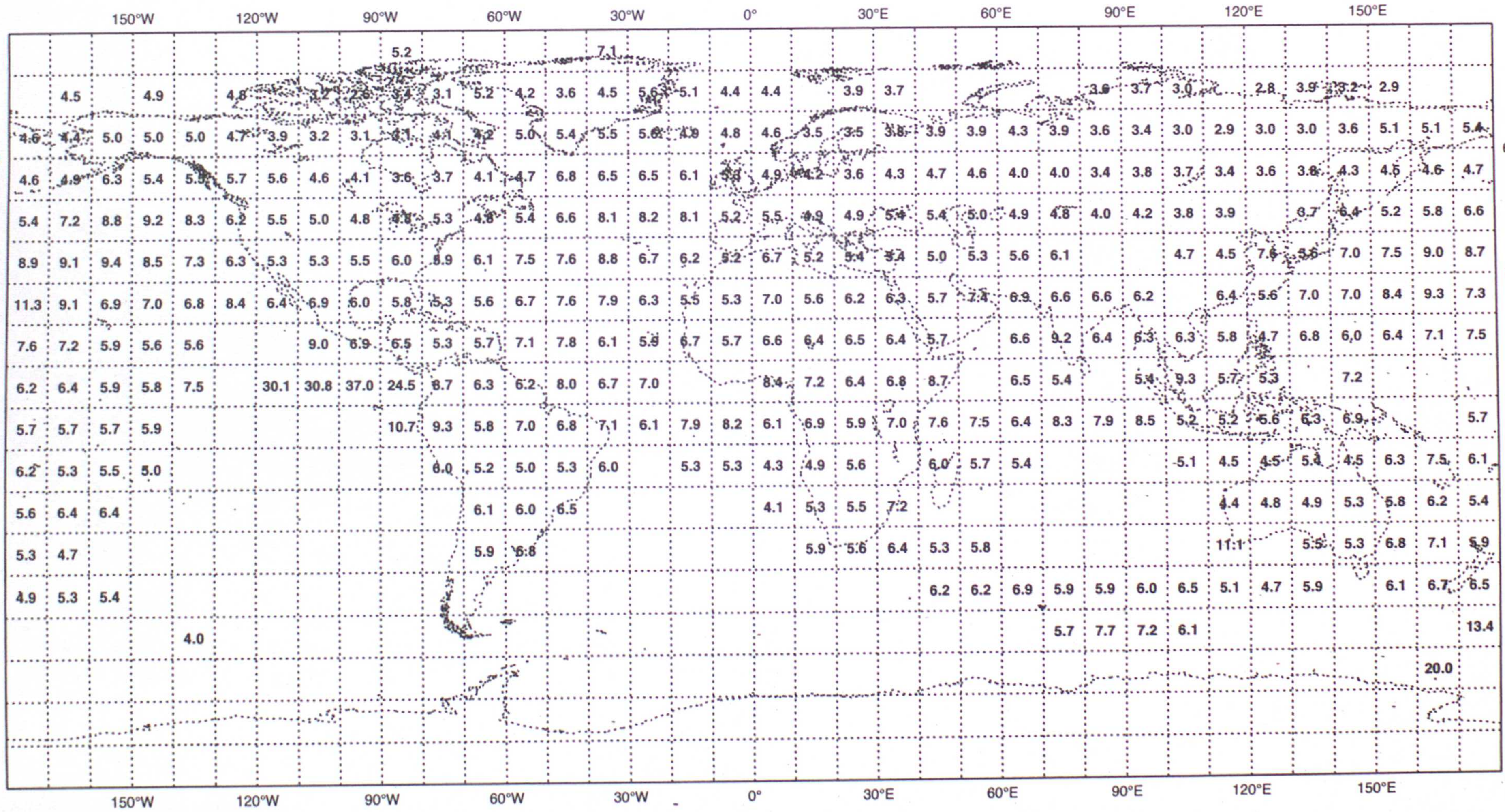

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
5.2 7.1
4.5 4.9 4.8 3.2 2.6 3.4 3.1 5.2 4.2 3.6 4.5 5.6 5.1 4.4 4.4 3.9 3.7 3.9 3.7 3.0 2.8 3.9 3.2 2.9
4.6 4.4 5.0 5.0 5.0 4.7 3.9 3.2 3.1 4.1 4.1 4.2 5.0 5.4 5.5 5.6 4.9 4.8 4.6 3.5 3.5 3.8 3.9 3.9 4.3 3.9 3.6 3.4 3.0 2.9 3.0 3.0 3.6 5.1 5.1 5.4
4.6 4.9 6.3 5.4 5.5 5.7 5.6 4.6 4.1 3.6 3.7 4.1 4.7 6.8 6.5 6.5 6.1 5.3 4.9 4.2 3.6 4.3 4.7 4.6 4.0 4.0 3.4 3.8 3.7 3.4 3.6 3.8 4.3 4.5 4.6 4.7
5.4 7.2 8.8 9.2 8.3 6.2 5.5 5.0 4.8 4.8 5.3 4.8 5.4 6.6 8.1 8.2 8.1 5.2 5.5 4.9 4.9 5.4 5.4 5.0 4.9 4.8 4.0 4.2 3.8 3.9 6.7 6.4 5.2 5.8 6.6
8.9 9.1 9.4 8.5 7.3 6.3 5.3 5.3 5.5 6.0 8.9 6.1 7.5 7.6 8.8 6.7 6.2 5.2 6.7 5.2 5.4 5.4 5.0 5.3 5.6 6.1 4.7 4.5 7.6 5.6 7.0 7.5 9.0 8.7
11.3 9.1 6.9 7.0 6.8 8.4 6.4 6.9 6.0 5.8 5.3 5.6 6.7 7.6 7.9 6.3 5.5 5.3 7.0 5.6 6.2 6.3 5.7 7.4 6.9 6.6 6.6 6.2 6.4 5.6 7.0 7.0 8.4 9.3 7.3
7.6 7.2 5.9 5.6 5.6 9.0 6.9 6.5 5.3 5.7 7.1 7.8 6.1 5.8 6.7 5.7 6.6 6.4 6.5 6.4 5.7 6.6 9.2 6.4 6.3 6.3 5.8 4.7 6.8 6.0 6.4 7.1 7.5
6.2 6.4 5.9 5.8 7.5 30.1 30.8 37.0 24.5 8.7 6.3 6.2 8.0 6.7 7.0 8.4 7.2 6.4 6.8 8.7 6.5 5.4 5.4 9.3 5.7 5.3 7.2
5.7 5.7 5.7 5.9 10.7 9.3 5.8 7.0 6.8 7.1 6.1 7.9 8.2 6.1 6.9 5.9 7.0 7.6 7.5 6.4 8.3 7.9 8.5 5.2 5.2 5.6 6.3 6.9 5.7
6.2 5.3 5.5 5.0 6.0 5.2 5.0 5.3 6.0 5.3 5.3 4.3 4.9 5.6 6.0 5.7 5.4 5.1 4.5 4.5 5.4 4.5 6.3 7.5 6.1
5.6 6.4 6.4 6.1 6.0 6.5 4.1 5.3 5.5 7.2 4.4 4.8 4.9 5.3 5.8 6.2 5.4
5.3 4.7 5.9 6.8 5.9 5.6 6.4 5.3 5.8 11.1 5.5 5.3 6.8 7.1 5.9
4.9 5.3 5.4 6.2 6.2 6.9 5.9 5.9 6.0 6.5 5.1 4.7 5.9 6.1 6.7 6.5
4.0 5.7 7.7 7.2 6.1 13.4
20.0

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). JANUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

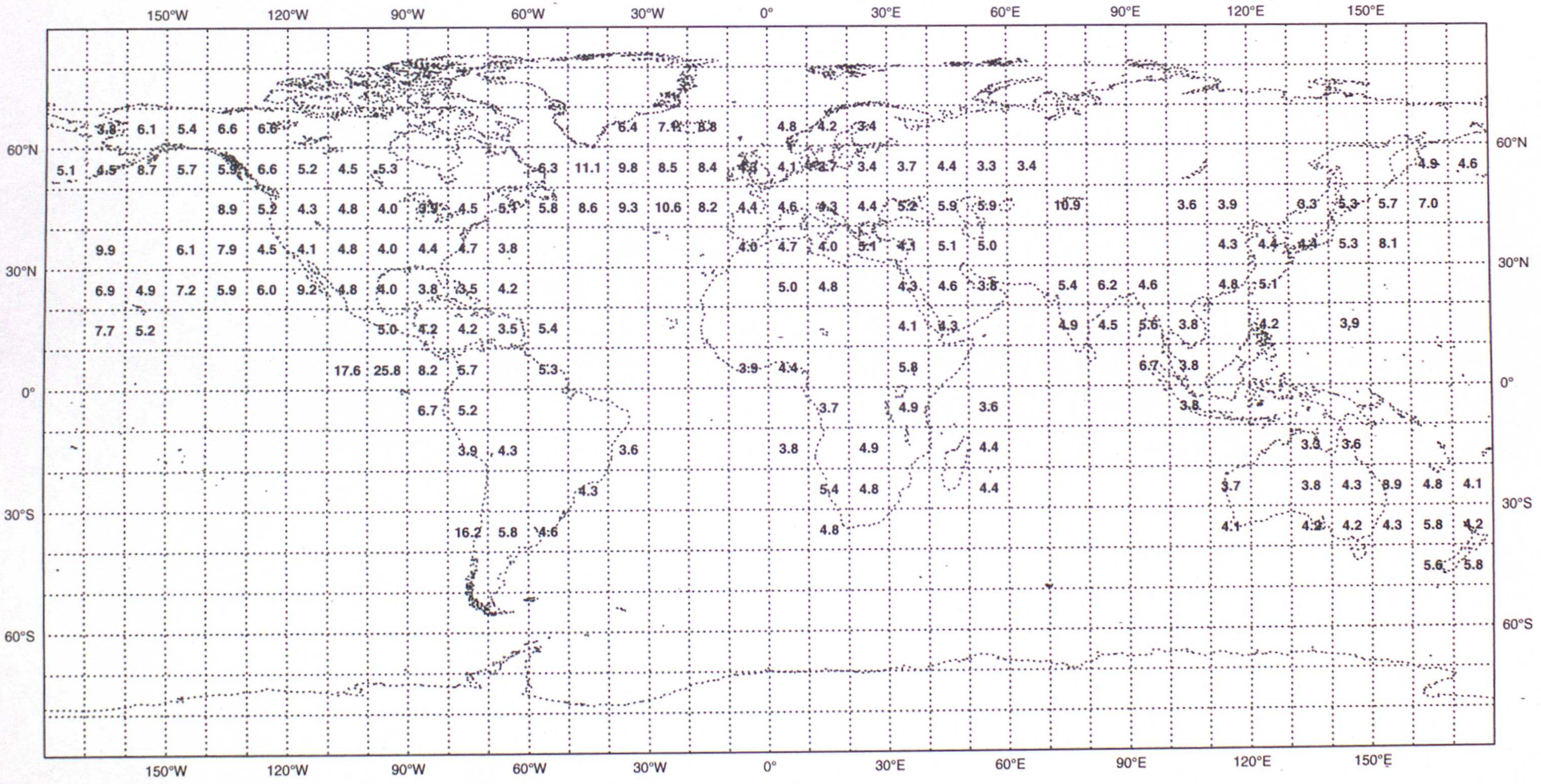

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.8 6.1 5.4 6.6 6.6 6.4 7.9 8.8 4.8 4.2 3.4
5.1 4.5 8.7 5.7 5.9 6.6 5.2 4.5 5.3 6.3 11.1 9.8 8.5 8.4 4.8 4.1 3.7 3.4 3.7 4.4 3.3 3.4 4.9 4.6
8.9 5.2 4.3 4.8 4.0 3.9 4.5 5.1 5.8 8.6 9.3 10.6 8.2 4.4 4.6 4.3 4.4 5.2 5.9 5.9 10.9 3.6 3.9 6.3 5.3 5.7 7.0
9.9 6.1 7.9 4.5 4.1 4.8 4.0 4.4 4.7 3.8 4.0 4.7 4.0 5.1 4.1 5.1 5.0 4.3 4.4 4.4 5.3 8.1
6.9 4.9 7.2 5.9 6.0 9.2 4.8 4.0 3.8 3.5 4.2 5.0 4.8 4.3 4.6 3.8 5.4 6.2 4.6 4.8 5.1
7.7 5.2 5.0 4.2 4.2 3.5 5.4 4.1 4.3 4.9 4.5 5.6 3.8 4.2 3.9
17.6 25.8 8.2 5.7 5.3 3.9 4.4 5.8 6.7 3.8
6.7 5.2 3.7 4.9 3.6 3.8
3.9 4.3 3.6 3.8 4.9 4.4 3.3 3.6
4.3 5.4 4.8 4.4 3.7 3.8 4.3 8.9 4.8 4.1
16.2 5.8 4.6 4.8 4.1 4.2 4.2 4.3 5.8 4.2
5.6 5.8
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	00	Z	50	73/ 80	10	3	73.7	247.7	258.4	7
34247	12	Z	50	50/ 41	17	1	94.3	171.9	196.0	7
42101	00	Z	150	30/ 76	14	0	59.9	-130.0	143.1	8
42101	12	Z	250	30/ 76	21	0	49.4	-74.6	89.5	4
42182	00	Z	1000	29/ 77	13	12	18.4	-66.8	69.3	10
42182	12	Z	1000	29/ 77	15	12	15.6	-75.1	76.7	10
42339	00	Z	1000	26/ 73	7	19	7.2	-83.9	84.2	5
42361	00	Z	1000	26/ 78	15	4	21.3	-60.8	64.4	5
42361	12	Z	1000	26/ 78	9	8	14.1	-60.4	62.1	4
42369	00	Z	150	27/ 81	15	0	34.8	-184.8	188.0	8
42369	12	Z	250	27/ 81	17	0	33.7	-100.7	106.2	7
42410	00	Z	1000	26/ 92	20	9	13.2	-81.3	82.4	5
42410	12	Z	1000	26/ 92	9	19	6.8	-86.7	86.9	4
42492	00	Z	150	26/ 85	23	1	79.2	-57.2	97.7	5
42647	00	Z	250	23/ 73	12	0	78.7	-45.8	91.0	4
42667	12	Z	150	23/ 77	10	0	62.6	-143.8	156.9	5
42809	00	Z	200	23/ 88	28	0	70.9	-77.3	104.9	6
42809	12	Z	200	23/ 88	28	0	48.3	-70.4	85.3	5
42867	00	Z	200	21/ 79	12	0	55.7	-138.8	149.6	6
42867	12	Z	200	21/ 79	17	0	99.6	-34.4	105.4	6
42874	00	Z	250	21/ 82	10	0	75.0	107.6	131.2	6
42971	00	Z	200	20/ 86	23	0	66.3	-51.1	83.7	4
43003	00	Z	1000	19/ 73	30	0	15.8	-51.5	53.9	12
43003	12	Z	1000	19/ 73	28	0	17.1	-56.9	59.4	8
43128	00	Z	150	17/ 78	26	0	85.3	-37.0	93.0	4
43128	12	Z	50	17/ 78	19	1	132.4	78.7	154.0	6
43150	00	Z	1000	18/ 83	29	0	17.3	-61.6	64.0	5
43185	00	Z	200	16/ 81	21	0	74.8	-96.5	122.1	8
43192	00	Z	1000	15/ 74	10	15	11.5	-89.5	90.2	4
43285	00	Z	1000	13/ 75	1	26	0.0	-100.0	100.0	5
43285	12	Z	1000	13/ 75	2	20	4.5	-86.5	86.6	5
43295	00	Z	70	13/ 78	8	0	198.4	45.5	203.5	11
43295	12	Z	50	13/ 78	7	3	107.4	254.1	275.9	11
43346	00	Z	50	11/ 80	16	0	81.7	144.1	165.6	6
43346	12	Z	70	11/ 80	11	2	91.4	170.5	193.4	9
43353	00	Z	1000	10/ 76	23	2	10.1	-77.1	77.8	4
43371	00	Z	150	8/ 77	13	0	97.7	-115.1	150.9	7
43466	12	Z	200	7/ 80	5	0	136.4	25.6	138.8	4
96935	00	Z	1000	-7/ 113	9	4	10.5	-84.2	84.9	4

Figure 8. TEMP 500 hPa geopotential mean daily count. JANUARY 2004
All hours
Global average number of observations in 24 hours = 1142

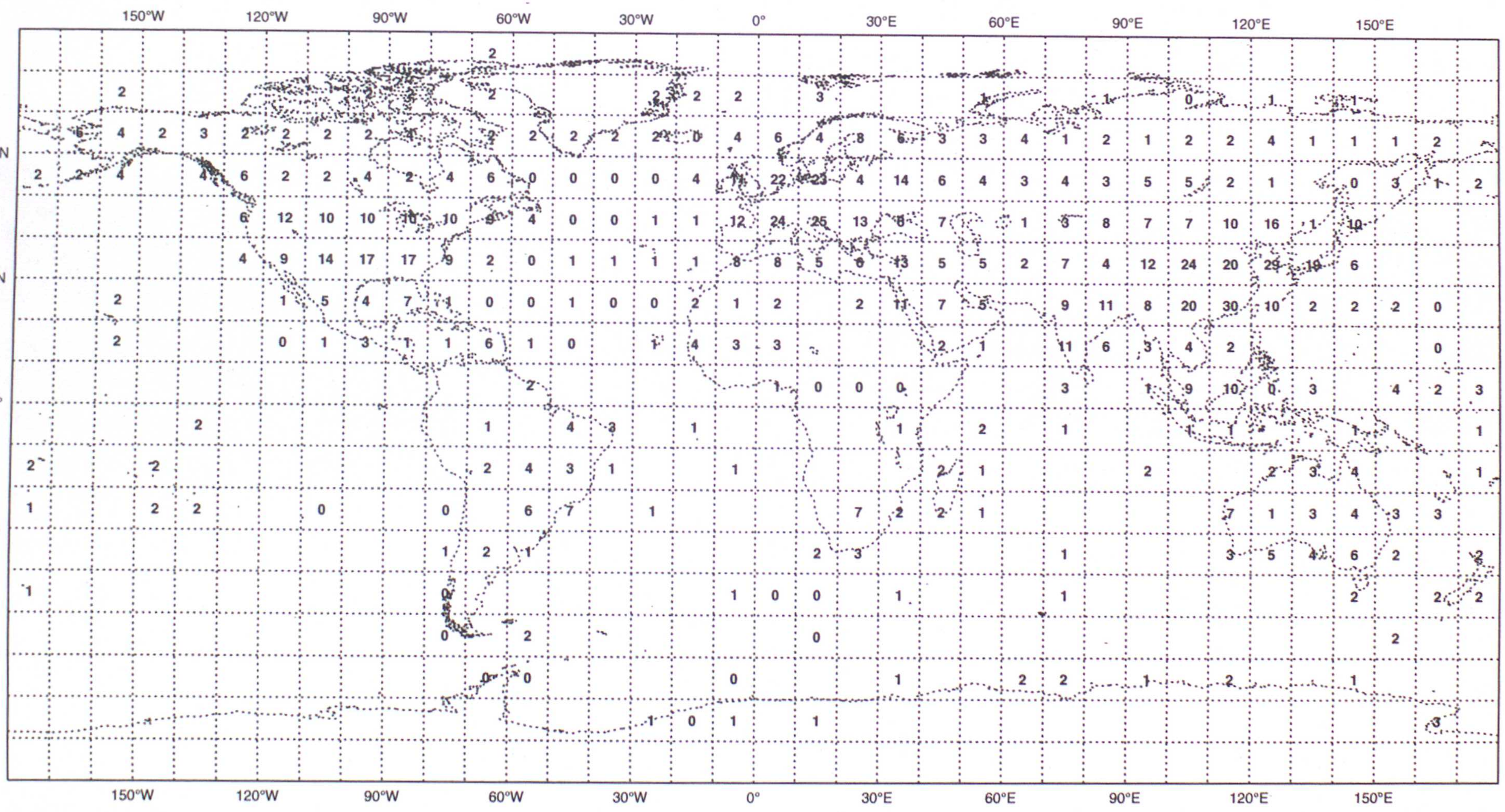

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
FQFM	12	V	1000	31/ -42	10	0	100	-3.4	-8.6	17.4	1
07110	00	V	200	48/ -4	31	0	12	-1.4	-0.1	15.1	1
07110	12	V	250	48/ -4	30	0	16	-4.2	2.3	24.3	3
10437	12	V	250	51/ 9	15	0	6	3.4	5.6	17.2	1
40582	00	V	250	29/ 48	17	0	5	-1.0	5.3	26.5	1
42182	00	V	200	29/ 77	19	0	100	-18.3	-5.7	24.5	3
42182	12	V	150	29/ 77	15	0	100	-17.8	-5.0	23.6	4
42369	00	V	250	27/ 81	24	0	100	3.2	-0.7	18.1	2
42369	12	V	250	27/ 81	21	0	100	3.1	0.6	28.2	1
42379	00	V	250	27/ 83	11	0	100	-9.1	-10.3	20.1	2
42379	12	V	250	27/ 83	12	0	100	-6.9	-14.7	22.3	2
42410	00	V	250	26/ 92	17	0	100	-6.5	2.5	18.8	2
43041	00	V	200	19/ 82	10	0	20	-1.5	-1.5	16.6	1
47058	00	V	300	39/ 126	12	0	100	-7.0	-0.3	17.5	1
48407	12	V	150	15/ 105	20	0	75	-12.7	-4.4	21.7	3
57972	12	V	100	26/ 113	26	0	7	5.5	0.1	18.0	1
58968	00	V	100	25/ 122	29	0	37	-0.5	-2.3	16.4	1
58968	12	V	200	25/ 122	31	0	29	1.8	-8.2	16.6	3
60360	12	V	200	37/ 8	10	0	100	10.5	1.4	15.8	2
60559	12	V	300	33/ 7	12	0	100	0.3	3.8	16.3	2
60566	12	V	150	32/ 4	13	0	100	-12.1	-7.0	20.8	2
60620	12	V	250	28/ 0	11	0	100	-17.1	1.0	21.7	2
60680	00	V	200	23/ 5	26	0	3	-0.5	-4.2	18.7	1
61223	12	V	200	17/ -3	10	1	20	-2.3	2.6	17.3	3
62306	12	V	150	31/ 27	23	0	13	-0.1	2.7	15.0	1
62337	00	V	200	31/ 34	20	0	100	-4.7	16.5	20.1	4
62337	12	V	200	31/ 34	20	0	100	-4.8	16.4	19.9	4
62378	00	V	200	30/ 31	29	0	100	-22.2	-5.1	27.9	5
62378	12	V	200	30/ 31	30	1	100	-21.5	-3.4	25.6	5
62403	00	V	100	26/ 33	23	2	30	-1.9	0.0	21.0	5
62403	12	V	200	26/ 33	30	0	13	4.8	3.0	35.1	3
62414	12	V	150	24/ 33	10	0	10	-7.2	4.1	43.4	1
62423	00	V	300	27/ 28	28	0	7	-5.4	1.3	16.2	1
64700	00	V	200	12/ 15	16	0	100	-3.8	-1.3	16.7	1
68512	12	V	100	-30/ 18	10	0	100	12.6	-6.3	23.7	2
72376	12	V	300	37/-108	28	0	100	-2.2	-2.0	16.3	1
88889	12	V	250	-52/ -58	25	0	4	-2.6	2.7	21.3	2
96749	00	V	100	-6/ 107	22	0	100	1.4	-0.3	16.5	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. JANUARY 2004
All hours
Global average number of observations in 24 hours = 1311

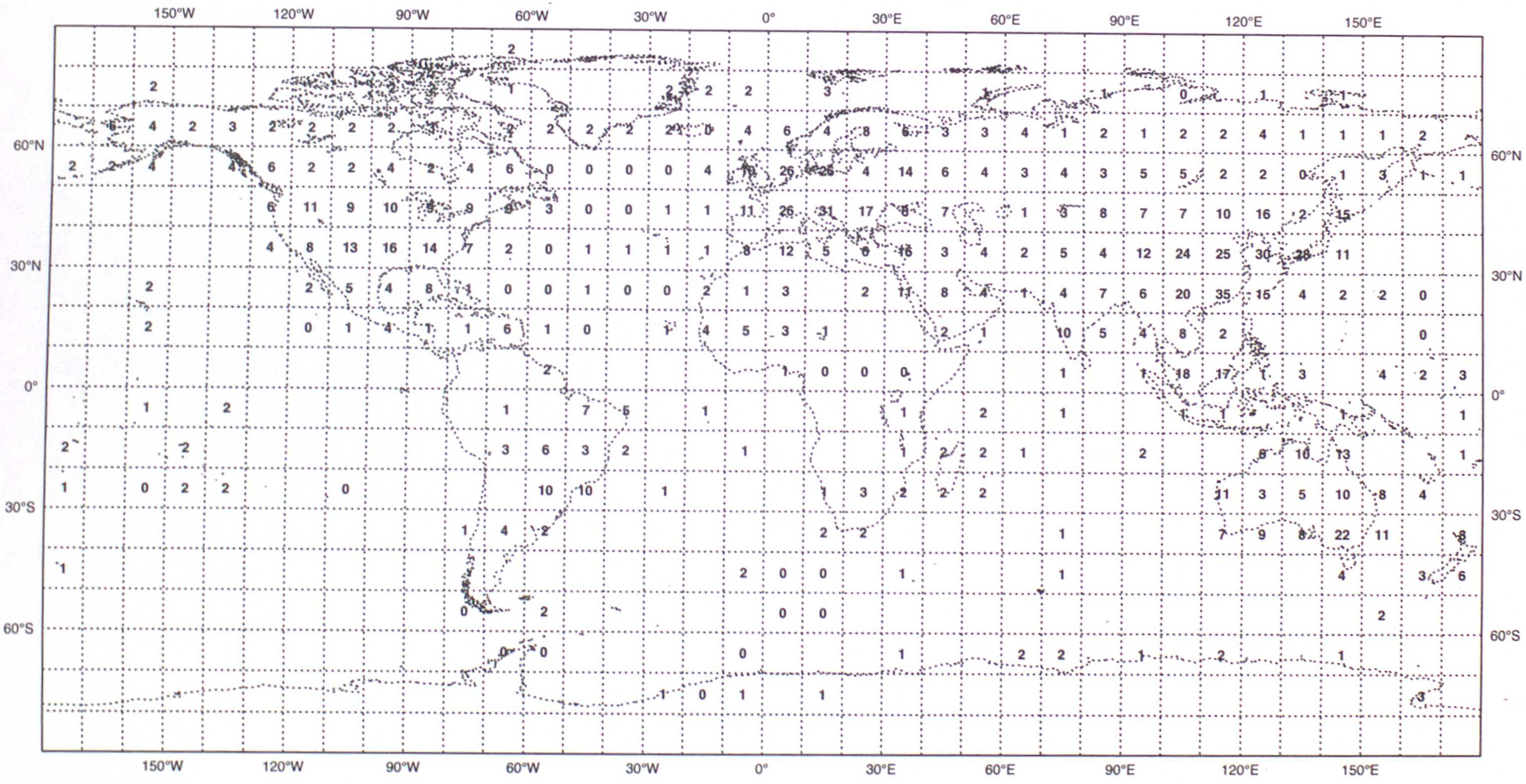

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
33791	12	DD	48/ 33	27	-12.3	3.0	10.0
42182	00	DD	29/ 77	20	11.7	3.4	10.7
42182	12	DD	29/ 77	21	13.2	3.2	12.1
62337	12	DD	31/ 34	20	-19.3	1.7	6.1
78954	12	DD	13/ -59	18	-12.3	5.2	19.4
97014	00	DD	2/ 125	8	10.7	9.9	21.0

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: EXETER

MONTH: Jan 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. JANUARY 2004
Global average number of observations in 24 hours = 88536

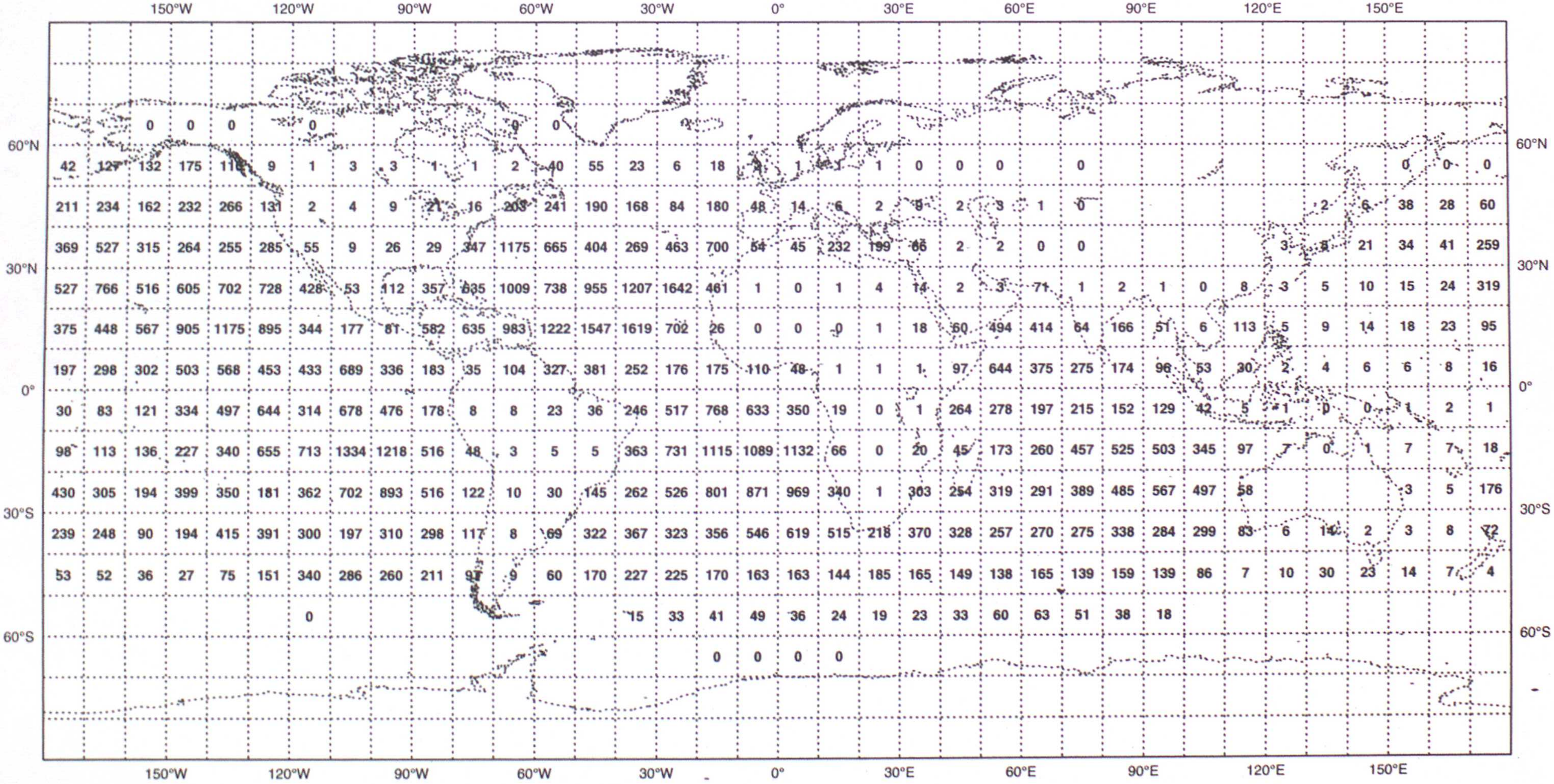

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0
42 127 132 175 118 9 1 3 3 1 1 2 40 55 23 6 18 1 1 1 1 0 0 0 0 0 0 0
211 234 162 232 266 131 2 4 9 21 16 203 241 190 168 84 180 48 14 6 2 8 2 3 1 0 2 6 38 28 60
369 527 315 264 255 285 55 9 26 29 347 1175 665 404 269 463 700 54 45 232 199 66 2 2 0 0 3 8 21 34 41 259
527 766 516 605 702 728 428 53 112 357 635 1009 738 955 1207 1642 461 1 0 1 4 14 2 3 71 1 2 1 0 8 3 5 10 15 24 319
375 448 567 905 1175 895 344 177 81 582 635 983 1222 1547 1619 702 26 0 0 0 1 18 60 494 414 64 166 51 6 113 5 9 14 18 23 95
197 298 302 503 568 453 433 689 336 183 35 104 327 381 252 176 175 110 48 1 1 1 97 644 375 275 174 96 53 30 2 4 6 6 8 16
30 83 121 334 497 644 314 678 476 178 8 8 23 36 246 517 768 633 350 19 0 1 264 278 197 215 152 129 42 5 1 0 0 1 2 1
98 113 136 227 340 655 713 1334 1218 516 48 3 5 5 363 731 1115 1089 1132 66 0 20 45 173 260 457 525 503 345 97 7 0 1 7 7 18
430 305 194 399 350 181 362 702 893 516 122 10 30 145 262 526 801 871 969 340 1 303 254 319 291 389 485 567 497 58 3 5 176
239 248 90 194 415 391 300 197 310 298 117 8 69 322 367 323 356 546 619 515 218 370 328 257 270 275 338 284 299 83 6 14 2 3 8 72
53 52 36 27 75 151 340 286 260 211 97 9 60 170 227 225 170 163 163 144 185 165 149 138 165 139 159 139 86 7 10 30 23 14 7 4
0 15 33 41 49 36 24 19 23 33 60 63 51 38 18
0 0 0 0

Figure 11. SATOB 701 - 1000 hPa vector mean wind. JANUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

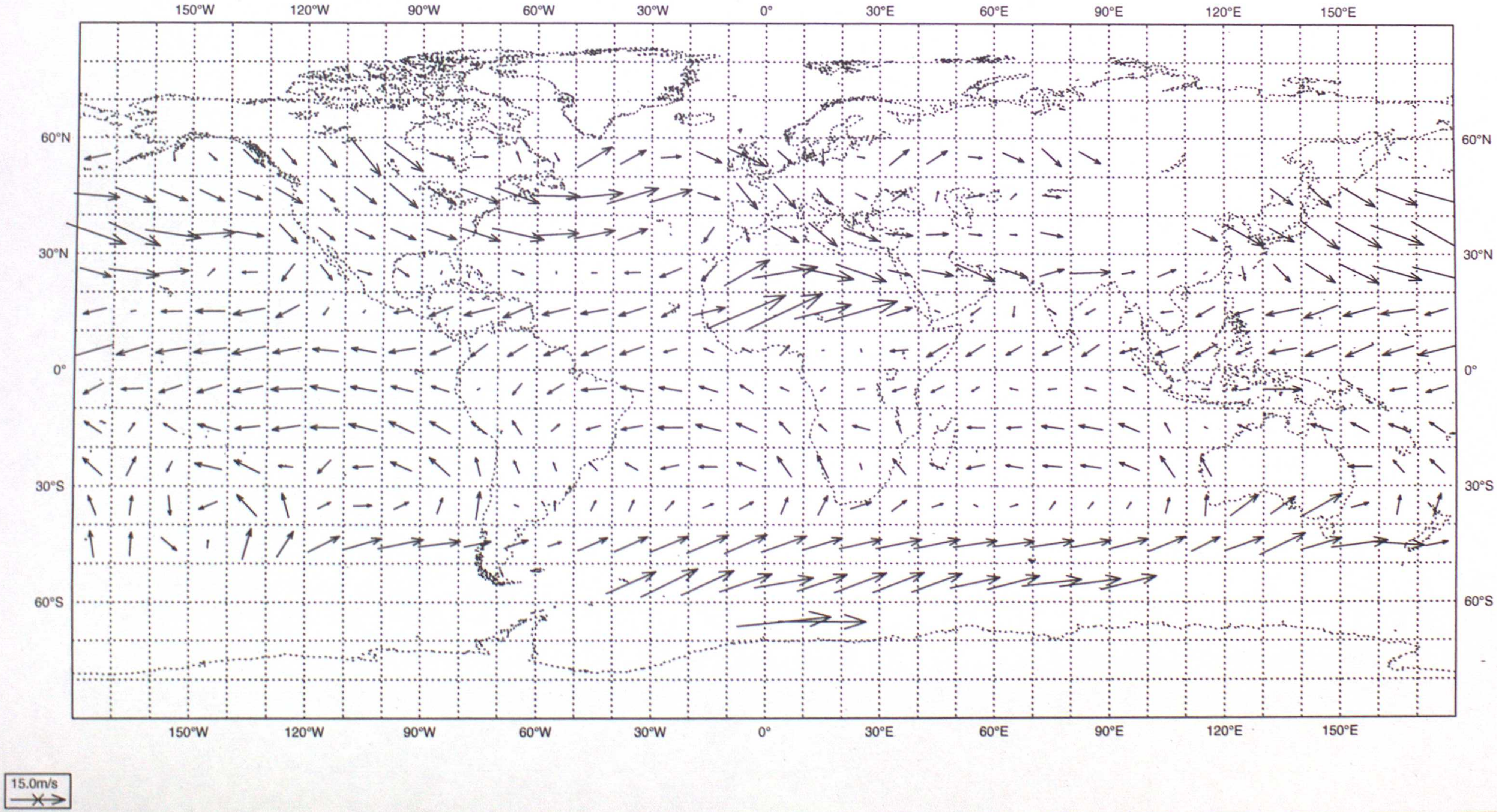

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. JANUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

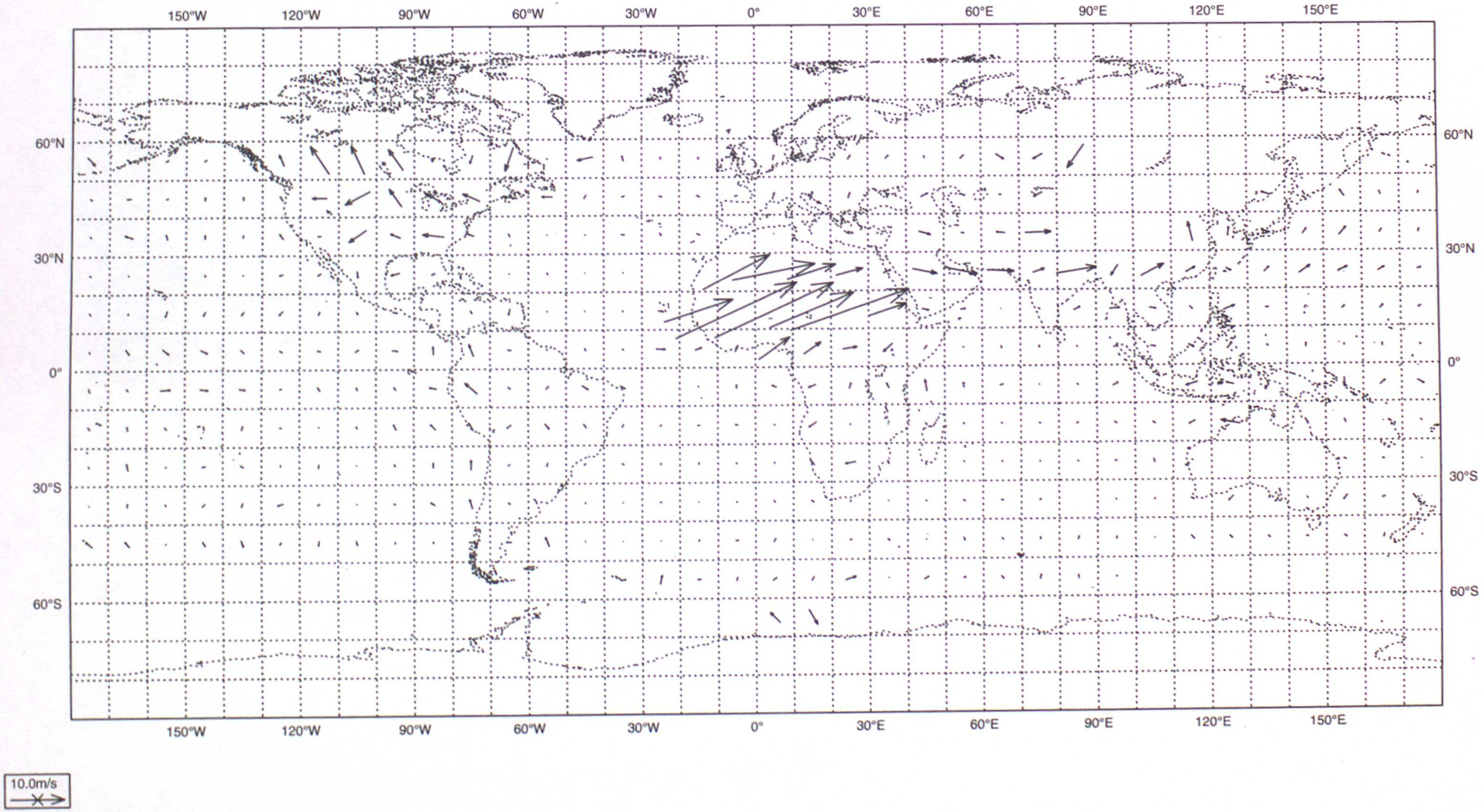

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). JANUARY 2004
All observations
Values are plotted where greater than 10 obs are present

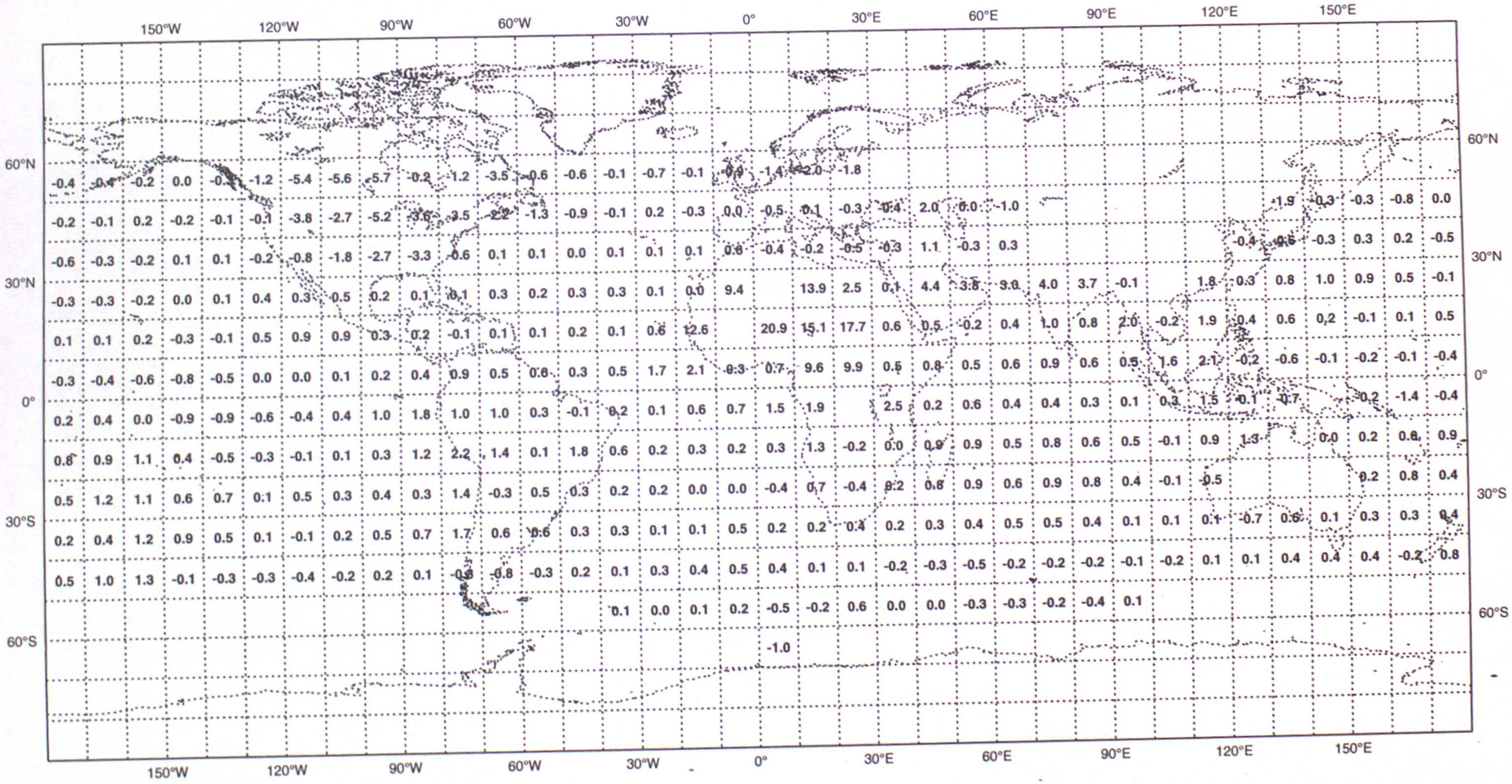

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-0.4 -0.4 -0.2 0.0 -1.2 -5.4 -5.6 -5.7 -0.2 -1.2 -3.5 -0.6 -0.6 -0.1 -0.7 -0.1 0.0 -1.4 -2.0 -1.8
-0.2 -0.1 0.2 -0.2 -0.1 -0.1 -3.8 -2.7 -5.2 -3.6 -3.5 -2.2 -1.3 -0.9 -0.1 0.2 -0.3 0.0 -0.5 0.1 -0.3 -0.4 2.0 0.0 -1.0 -1.9 -0.3 -0.3 -0.8 0.0
-0.6 -0.3 -0.2 0.1 0.1 -0.2 -0.8 -1.8 -2.7 -3.3 -0.6 0.1 0.1 0.0 0.1 0.1 0.1 0.6 -0.4 -0.2 -0.5 -0.3 1.1 -0.3 0.3 -0.4 -0.6 -0.3 0.3 0.2 -0.5
-0.3 -0.3 -0.2 0.0 0.1 0.4 0.3 -0.5 0.2 0.1 0.1 0.3 0.2 0.3 0.3 0.1 0.0 9.4 13.9 2.5 0.1 4.4 3.8 3.0 4.0 3.7 -0.1 1.8 0.3 0.8 1.0 0.9 0.5 -0.1
0.1 0.1 0.2 -0.3 -0.1 0.5 0.9 0.9 0.3 0.2 -0.1 0.1 0.1 0.2 0.1 0.6 12.6 20.9 15.1 17.7 0.6 0.5 -0.2 0.4 1.0 0.8 2.0 -0.2 1.9 0.4 0.6 0.2 -0.1 0.1 0.5
-0.3 -0.4 -0.6 -0.8 -0.5 0.0 0.0 0.1 0.2 0.4 0.9 0.5 0.6 0.3 0.5 1.7 2.1 0.3 0.7 9.6 9.9 0.5 0.8 0.5 0.6 0.9 0.6 0.5 1.6 2.1 -0.2 -0.6 -0.1 -0.2 -0.1 -0.4
0.2 0.4 0.0 -0.9 -0.9 -0.6 -0.4 0.4 1.0 1.8 1.0 1.0 0.3 -0.1 0.2 0.1 0.6 0.7 1.5 1.9 2.5 0.2 0.6 0.4 0.4 0.3 0.1 0.3 1.5 -0.1 -0.7 -0.2 -1.4 -0.4
0.8 0.9 1.1 0.4 -0.5 -0.3 -0.1 0.1 0.3 1.2 2.2 1.4 0.1 1.8 0.6 0.2 0.3 0.2 0.3 1.3 -0.2 0.0 0.9 0.9 0.5 0.8 0.6 0.5 -0.1 0.9 1.3 0.0 0.2 0.8 0.9
0.5 1.2 1.1 0.6 0.7 0.1 0.5 0.3 0.4 0.3 1.4 -0.3 0.5 0.3 0.2 0.2 0.0 0.0 -0.4 0.7 -0.4 0.2 0.8 0.9 0.6 0.9 0.8 0.4 -0.1 -0.5 0.2 0.8 0.4
0.2 0.4 1.2 0.9 0.5 0.1 -0.1 0.2 0.5 0.7 1.7 0.6 0.6 0.3 0.3 0.1 0.1 0.5 0.2 0.2 0.4 0.2 0.3 0.4 0.5 0.5 0.4 0.1 0.1 0.1 -0.7 0.6 0.1 0.3 0.3 0.4
0.5 1.0 1.3 -0.1 -0.3 -0.3 -0.4 -0.2 0.2 0.1 -0.8 -0.8 -0.3 0.2 0.1 0.3 0.4 0.5 0.4 0.1 0.1 -0.2 -0.3 -0.5 -0.2 -0.2 -0.2 -0.1 -0.2 0.1 0.1 0.4 0.4 0.4 -0.2 0.8
0.1 0.0 0.1 0.2 -0.5 -0.2 0.6 0.0 0.0 -0.3 -0.3 -0.2 -0.4 0.1
-1.0

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). JANUARY 2004
All observations
Values are plotted where greater than 10 obs are present

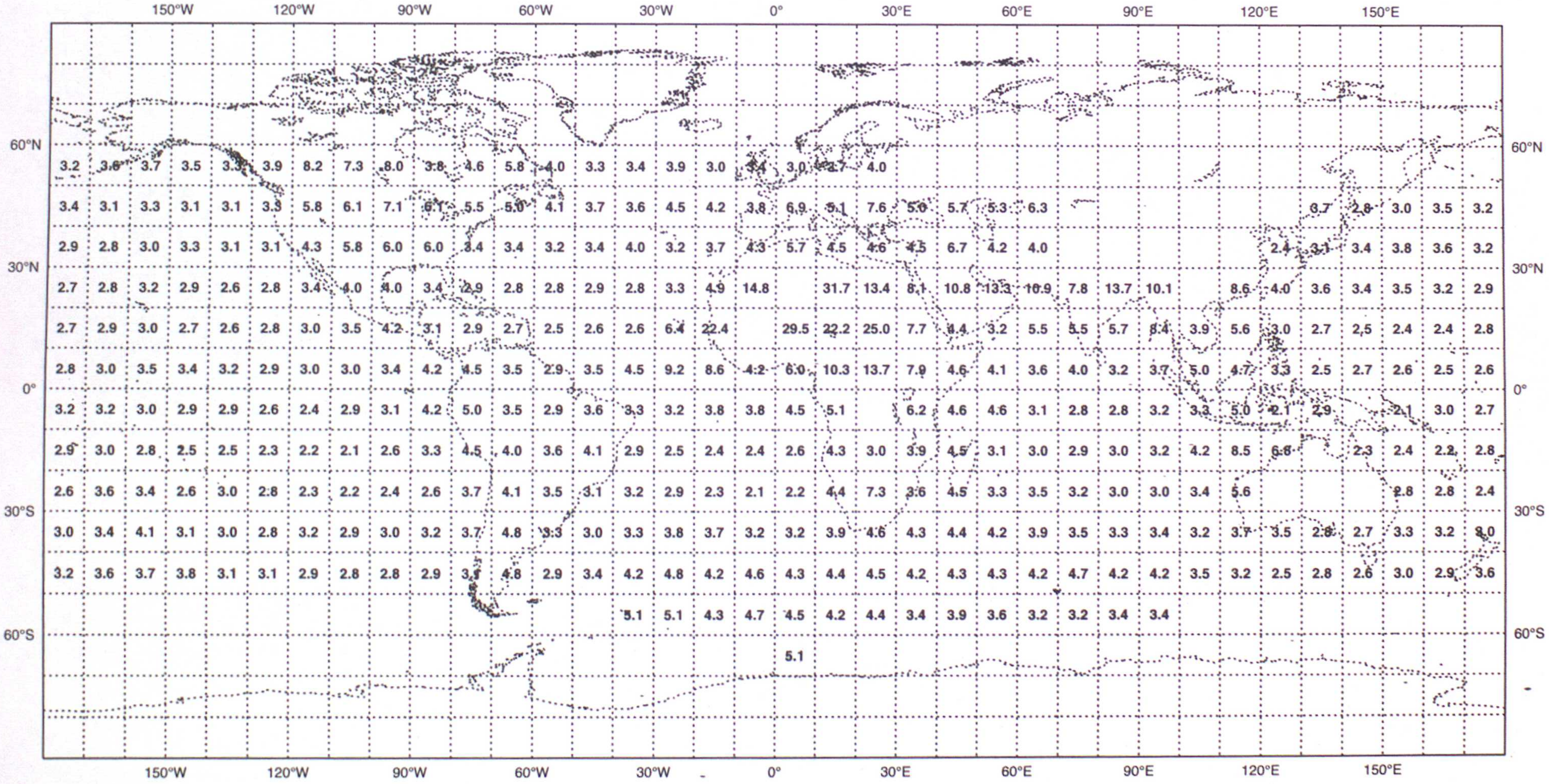

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
3.2 3.6 3.7 3.5 3.3 3.9 8.2 7.3 8.0 3.8 4.6 5.8 4.0 3.3 3.4 3.9 3.0 3.4 3.0 2.7 4.0
3.4 3.1 3.3 3.1 3.1 3.3 5.8 6.1 7.1 6.1 5.5 5.0 4.1 3.7 3.6 4.5 4.2 3.8 6.9 5.1 7.6 5.6 5.7 5.3 6.3 6.7 2.8 3.0 3.5 3.2
2.9 2.8 3.0 3.3 3.1 3.1 4.3 5.8 6.0 6.0 3.4 3.4 3.2 3.4 4.0 3.2 3.7 4.3 5.7 4.5 4.6 4.5 6.7 4.2 4.0 2.4 3.1 3.4 3.8 3.6 3.2
2.7 2.8 3.2 2.9 2.6 2.8 3.4 4.0 4.0 3.4 2.9 2.8 2.8 2.9 2.8 3.3 4.9 14.8 31.7 13.4 8.1 10.8 13.3 10.9 7.8 13.7 10.1 8.6 4.0 3.6 3.4 3.5 3.2 2.9
2.7 2.9 3.0 2.7 2.6 2.8 3.0 3.5 4.2 3.1 2.9 2.7 2.5 2.6 2.6 6.4 22.4 29.5 22.2 25.0 7.7 8.4 3.2 5.5 5.5 5.7 8.4 3.9 5.6 3.0 2.7 2.5 2.4 2.4 2.8
2.8 3.0 3.5 3.4 3.2 2.9 3.0 3.0 3.4 4.2 4.5 3.5 2.9 3.5 4.5 9.2 8.6 4.2 6.0 10.3 13.7 7.9 4.6 4.1 3.6 4.0 3.2 3.7 5.0 4.7 3.3 2.5 2.7 2.6 2.5 2.6
3.2 3.2 3.0 2.9 2.9 2.6 2.4 2.9 3.1 4.2 5.0 3.5 2.9 3.6 3.3 3.2 3.8 3.8 4.5 5.1 6.2 4.6 4.6 3.1 2.8 2.8 3.2 3.3 5.0 2.1 2.9 2.1 3.0 2.7
2.9 3.0 2.8 2.5 2.5 2.3 2.2 2.1 2.6 3.3 4.5 4.0 3.6 4.1 2.9 2.5 2.4 2.4 2.6 4.3 3.0 3.9 4.5 3.1 3.0 2.9 3.0 3.2 4.2 8.5 6.6 2.3 2.4 2.2 2.8
2.6 3.6 3.4 2.6 3.0 2.8 2.3 2.2 2.4 2.6 3.7 4.1 3.5 3.1 3.2 2.9 2.3 2.1 2.2 4.4 7.3 3.6 4.5 3.3 3.5 3.2 3.0 3.0 3.4 5.6 2.8 2.8 2.4
3.0 3.4 4.1 3.1 3.0 2.8 3.2 2.9 3.0 3.2 3.7 4.8 3.3 3.0 3.3 3.8 3.7 3.2 3.2 3.9 4.6 4.3 4.4 4.2 3.9 3.5 3.3 3.4 3.2 3.7 3.5 2.8 2.7 3.3 3.2 3.0
3.2 3.6 3.7 3.8 3.1 3.1 2.9 2.8 2.8 2.9 3.1 4.8 2.9 3.4 4.2 4.8 4.2 4.6 4.3 4.4 4.5 4.2 4.3 4.3 4.2 4.7 4.2 4.2 3.5 3.2 2.5 2.8 2.6 3.0 2.9 3.6
5.1 5.1 4.3 4.7 4.5 4.2 4.4 3.4 3.9 3.6 3.2 3.2 3.4 3.4
5.1

Figure 15. SATOB 401 - 700 hPa mean daily count. JANUARY 2004
Global average number of observations in 24 hours = 20302

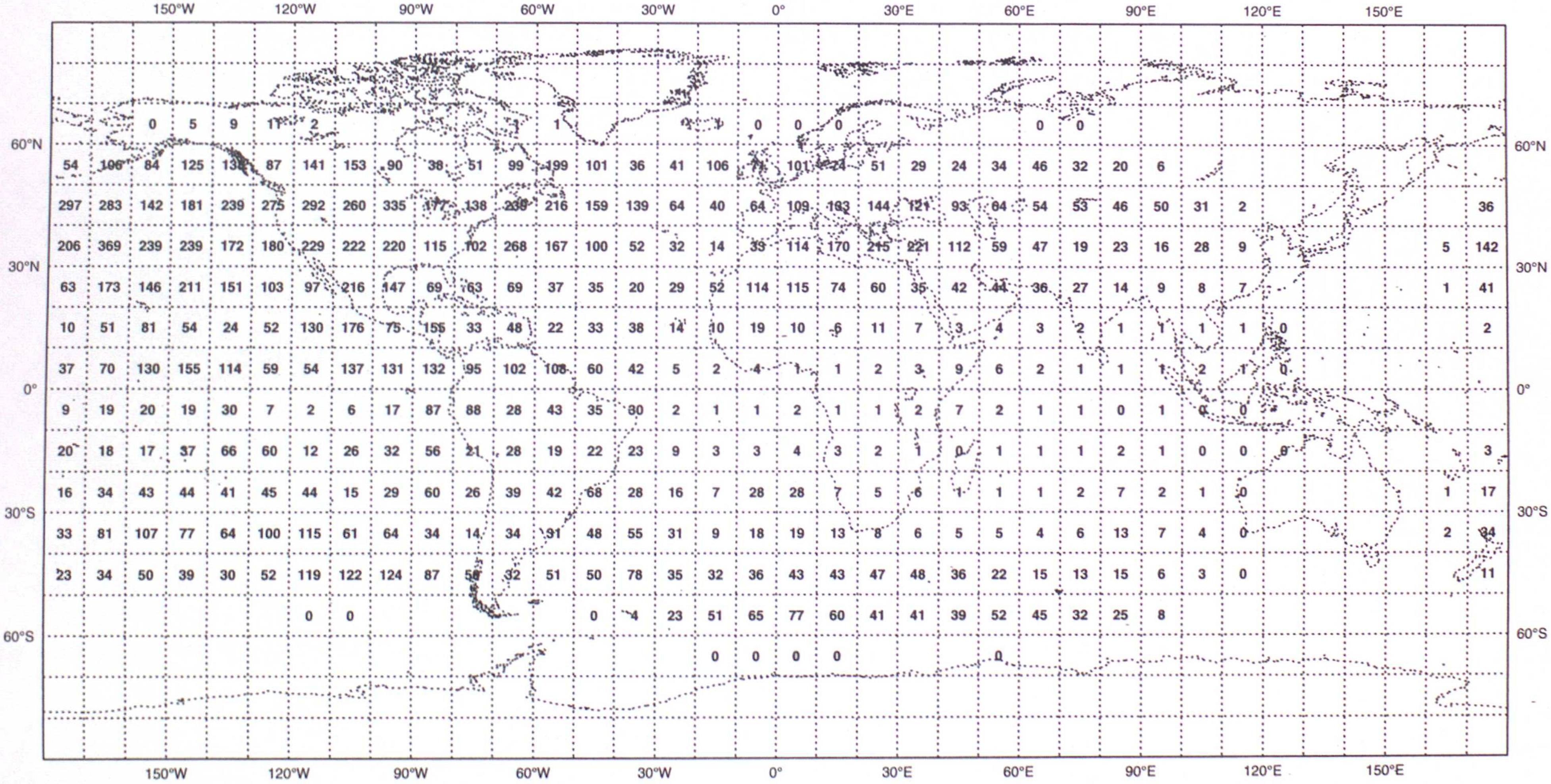

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 5 9 11 2 1 0 0 0 0 0
54 106 84 125 138 87 141 153 90 38 51 99 199 101 36 41 106 71 101 24 51 29 24 34 46 32 20 6
297 283 142 181 239 275 292 260 335 177 138 230 216 159 139 64 40 64 109 183 144 121 93 84 54 53 46 50 31 2 36
206 369 239 239 172 180 229 222 220 115 102 268 167 100 52 32 14 33 114 170 215 221 112 59 47 19 23 16 28 9 5 142
63 173 146 211 151 103 97 216 147 69 163 69 37 35 20 29 52 114 115 74 60 35 42 44 36 27 14 9 8 7 1 41
10 51 81 54 24 52 130 176 75 155 33 48 22 33 38 14 10 19 10 6 11 7 3 4 3 2 1 1 1 1 0 2
37 70 130 155 114 59 54 137 131 132 95 102 108 60 42 5 2 4 1 1 2 3 9 6 2 1 1 1 2 1 0
9 19 20 19 30 7 2 6 17 87 88 28 43 35 80 2 1 1 2 1 1 2 7 2 1 1 0 1 0 0
20 18 17 37 66 60 12 26 32 56 21 28 19 22 23 9 3 3 4 3 2 1 0 1 1 1 2 1 0 0 0 3
16 34 43 44 41 45 44 15 29 60 26 39 42 68 28 16 7 28 28 7 5 6 1 1 1 2 7 2 1 0 1 17
33 81 107 77 64 100 115 61 64 34 14 34 91 48 55 31 9 18 19 13 8 6 5 5 4 6 13 7 4 0 2 34
23 34 50 39 30 52 119 122 124 87 58 32 51 50 78 35 32 36 43 43 47 48 36 22 15 13 15 6 3 0 11
0 0 0 4 23 51 65 77 60 41 41 39 52 45 32 25 8
0 0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. JANUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

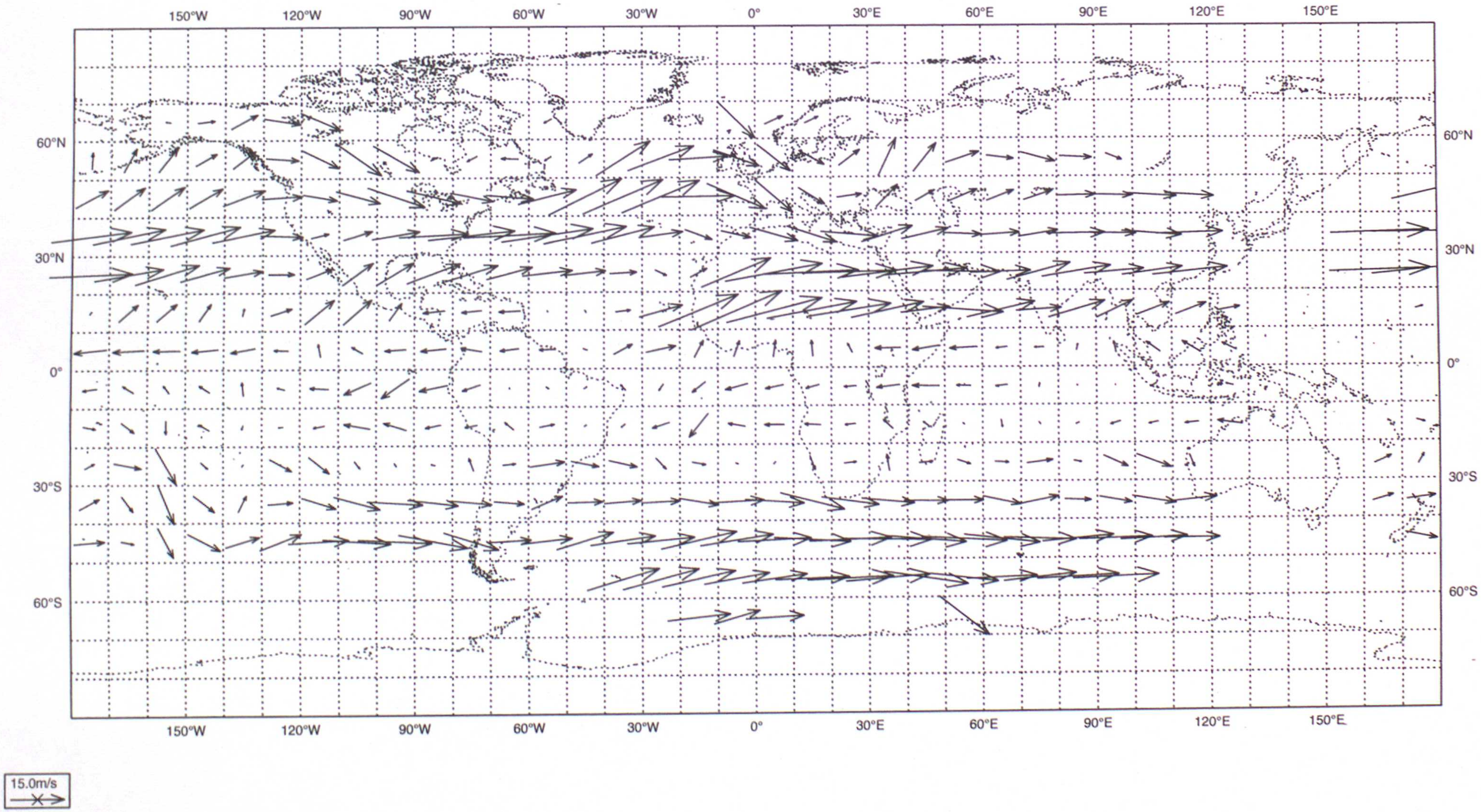

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. JANUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

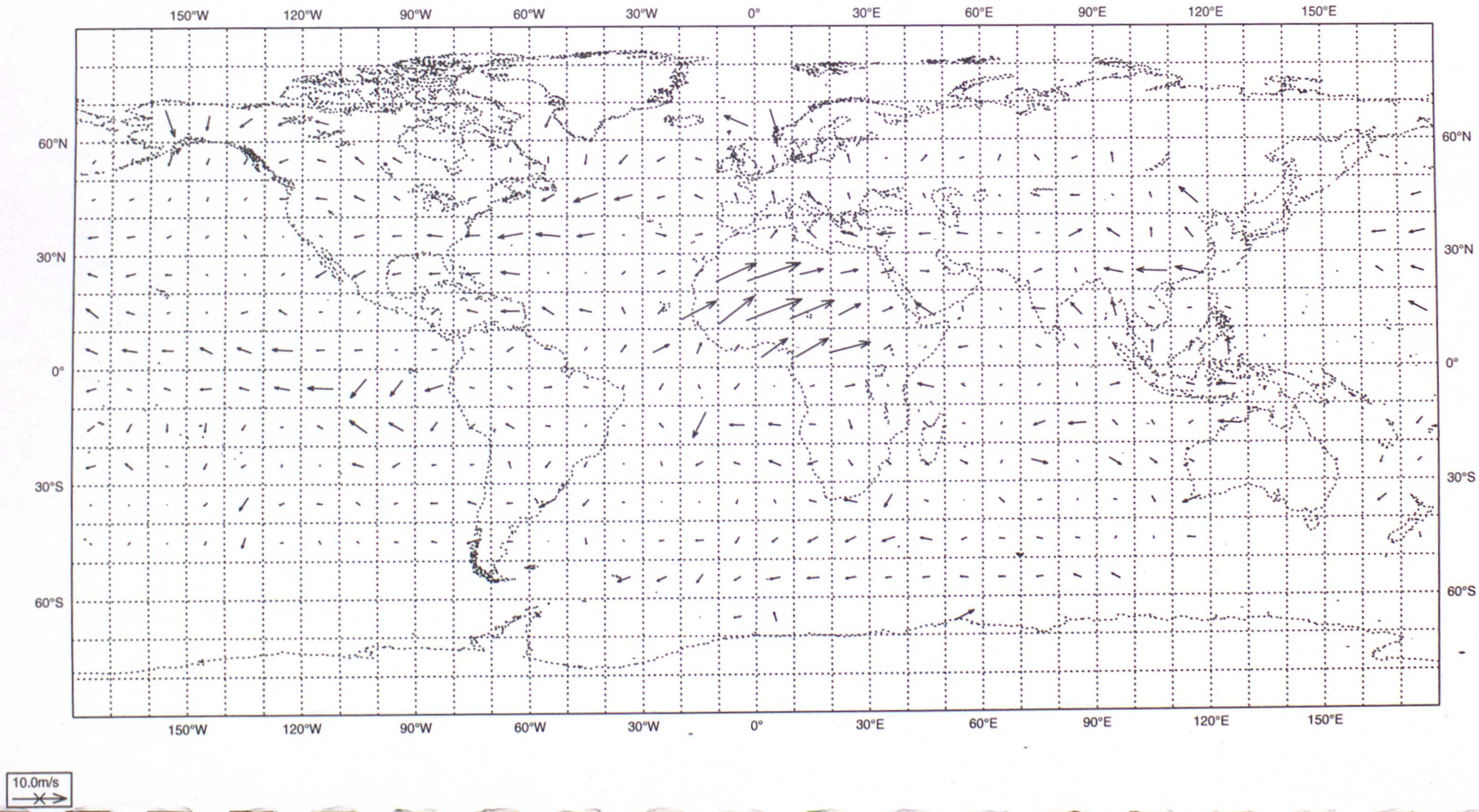

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). JANUARY 2004
All observations
Values are plotted where greater than 10 obs are present

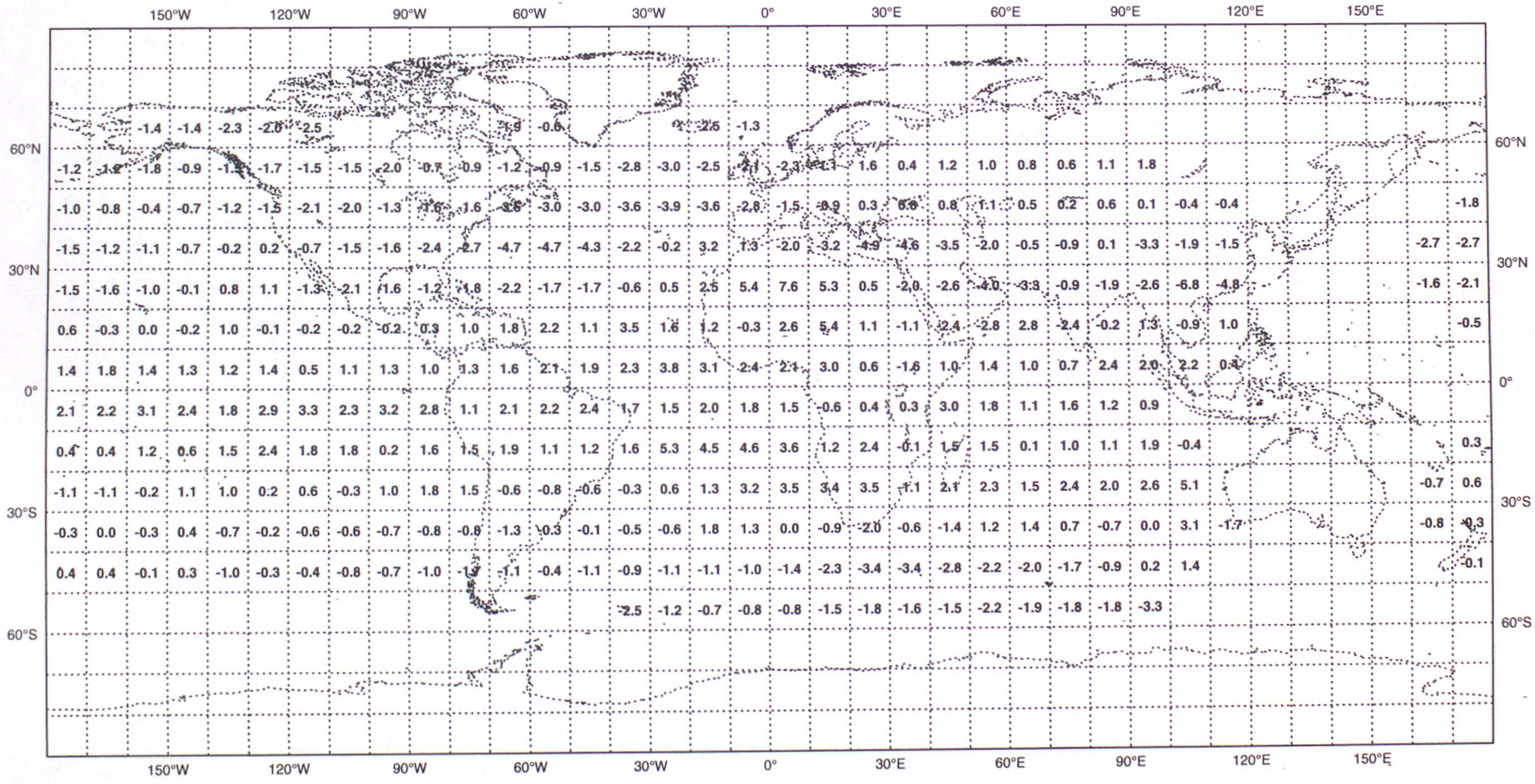

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.4 -1.4 -2.3 -2.0 -2.5 -1.9 -0.6 -2.5 -1.3
-1.2 -1.2 -1.8 -0.9 -1.2 -1.7 -1.5 -1.5 -2.0 -0.7 -0.9 -1.2 -0.9 -1.5 -2.8 -3.0 -2.5 -2.1 -2.3 -1.1 1.6 0.4 1.2 1.0 0.8 0.6 1.1 1.8
-1.0 -0.8 -0.4 -0.7 -1.2 -1.5 -2.1 -2.0 -1.3 -1.6 -1.6 -3.6 -3.0 -3.0 -3.6 -3.9 -3.6 -2.8 -1.5 -0.9 0.3 0.6 0.8 1.1 0.5 0.2 0.6 0.1 -0.4 -0.4 -1.8
-1.5 -1.2 -1.1 -0.7 -0.2 0.2 -0.7 -1.5 -1.6 -2.4 -2.7 -4.7 -4.7 -4.3 -2.2 -0.2 3.2 1.3 -2.0 -3.2 -4.9 -4.6 -3.5 -2.0 -0.5 -0.9 0.1 -3.3 -1.9 -1.5 -2.7 -2.7
-1.5 -1.6 -1.0 -0.1 0.8 1.1 -1.3 -2.1 1.6 -1.2 1.8 -2.2 -1.7 -1.7 -0.6 0.5 2.5 5.4 7.6 5.3 0.5 -2.0 -2.6 -4.0 -3.3 -0.9 -1.9 -2.6 -6.8 -4.8 -1.6 -2.1
0.6 -0.3 0.0 -0.2 1.0 -0.1 -0.2 -0.2 -0.2 0.3 1.0 1.8 2.2 1.1 3.5 1.6 1.2 -0.3 2.6 5.4 1.1 -1.1 -2.4 -2.8 2.8 -2.4 -0.2 1.3 -0.9 1.0 -0.5
1.4 1.8 1.4 1.3 1.2 1.4 0.5 1.1 1.3 1.0 1.3 1.6 2.1 1.9 2.3 3.8 3.1 -2.4 2.1 3.0 0.6 -1.6 1.0 1.4 1.0 0.7 2.4 2.0 2.2 0.4
2.1 2.2 3.1 2.4 1.8 2.9 3.3 2.3 3.2 2.8 1.1 2.1 2.2 2.4 1.7 1.5 2.0 1.8 1.5 -0.6 0.4 0.3 3.0 1.8 1.1 1.6 1.2 0.9
0.4 0.4 1.2 0.6 1.5 2.4 1.8 1.8 0.2 1.6 1.5 1.9 1.1 1.2 1.6 5.3 4.5 4.6 3.6 1.2 2.4 -0.1 1.5 1.5 0.1 1.0 1.1 1.9 -0.4 0.3
-1.1 -1.1 -0.2 1.1 1.0 0.2 0.6 -0.3 1.0 1.8 1.5 -0.6 -0.8 -0.6 -0.3 0.6 1.3 3.2 3.5 3.4 3.5 -1.1 2.1 2.3 1.5 2.4 2.0 2.6 5.1 -0.7 0.6
-0.3 0.0 -0.3 0.4 -0.7 -0.2 -0.6 -0.6 -0.7 -0.8 -0.8 -1.3 -0.3 -0.1 -0.5 -0.6 1.8 1.3 0.0 -0.9 -2.0 -0.6 -1.4 1.2 1.4 0.7 -0.7 0.0 3.1 -1.7 -0.8 -0.3
0.4 0.4 -0.1 0.3 -1.0 -0.3 -0.4 -0.8 -0.7 -1.0 -1.1 -1.1 -0.4 -1.1 -0.9 -1.1 -1.1 -1.0 -1.4 -2.3 -3.4 -3.4 -2.8 -2.2 -2.0 -1.7 -0.9 0.2 1.4 -0.1
-2.5 -1.2 -0.7 -0.8 -0.8 -1.5 -1.8 -1.6 -1.5 -2.2 -1.9 -1.8 -1.8 -3.3

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). JANUARY 2004
All observations
Values are plotted where greater than 10 obs are present

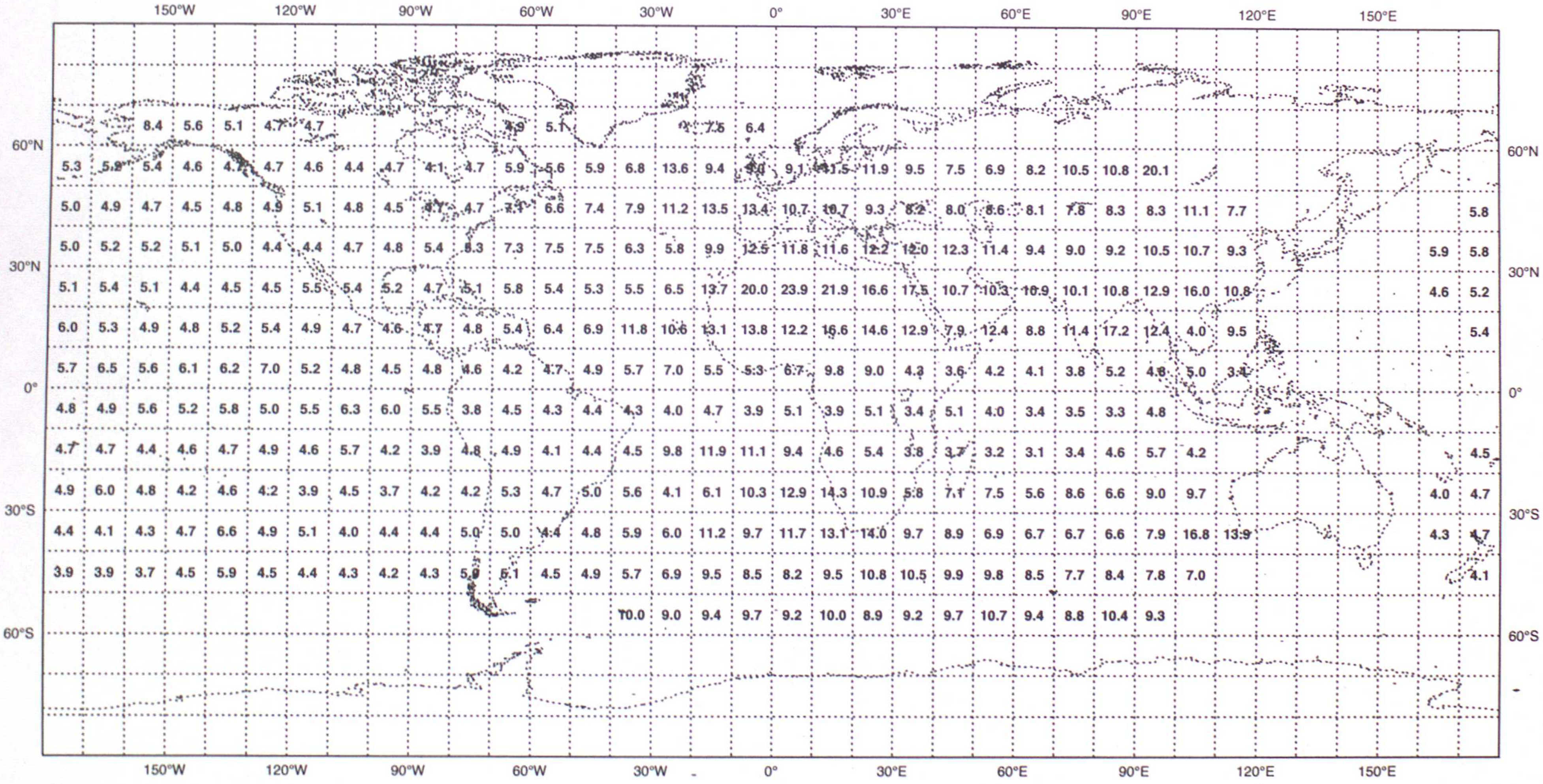
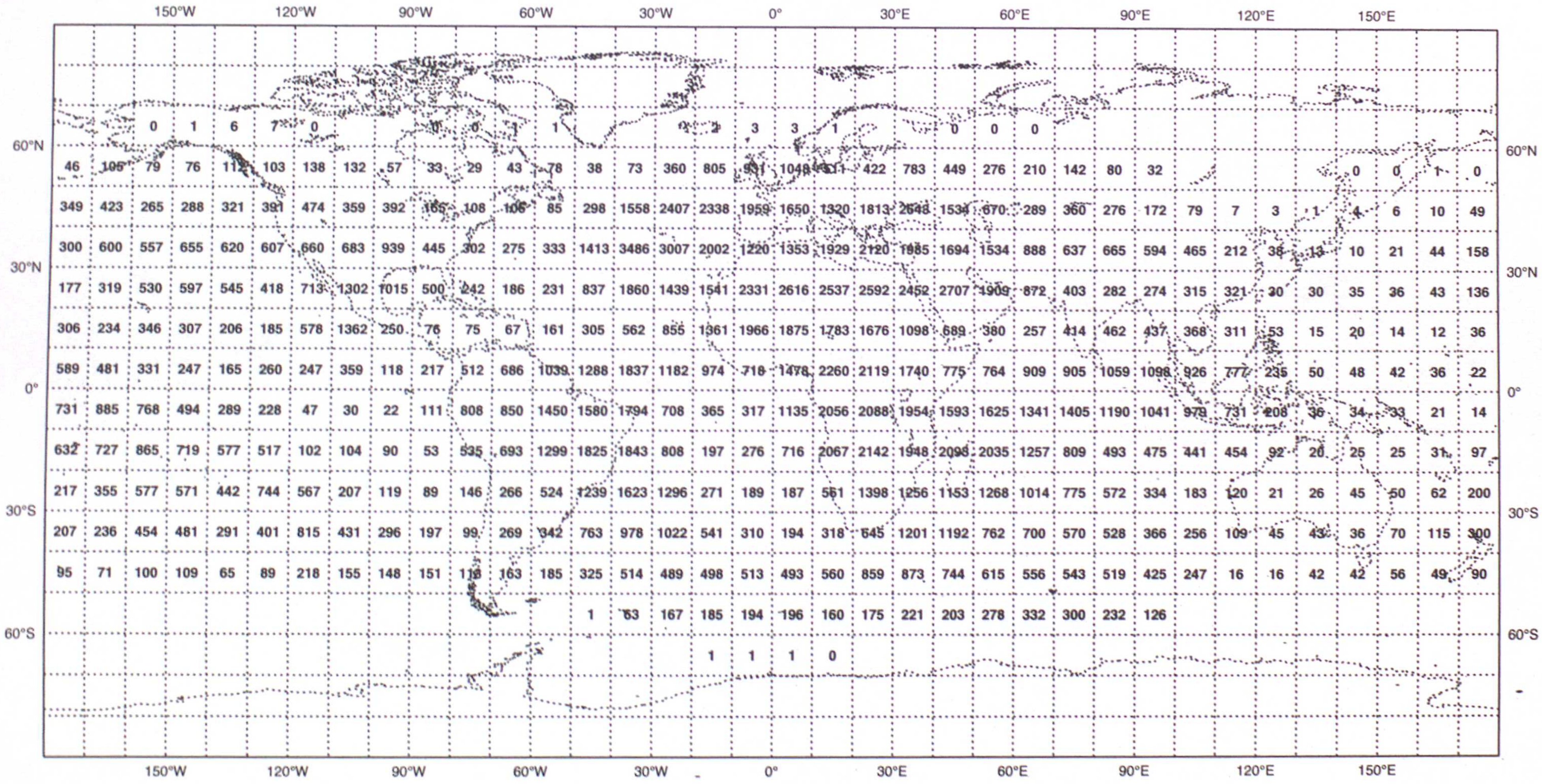

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
8.4 5.6 5.1 4.7 4.7 4.9 5.1 7.5 6.4
5.3 5.9 5.4 4.6 4.7 4.7 4.6 4.4 4.7 4.1 4.7 5.9 5.6 5.9 6.8 13.6 9.4 4.0 9.1 11.5 11.9 9.5 7.5 6.9 8.2 10.5 10.8 20.1
5.0 4.9 4.7 4.5 4.8 4.9 5.1 4.8 4.5 4.7 4.7 7.1 6.6 7.4 7.9 11.2 13.5 13.4 10.7 10.7 9.3 8.2 8.0 8.6 8.1 7.8 8.3 8.3 11.1 7.7 5.8
5.0 5.2 5.2 5.1 5.0 4.4 4.4 4.7 4.8 5.4 8.3 7.3 7.5 7.5 6.3 5.8 9.9 12.5 11.8 11.6 12.2 12.0 12.3 11.4 9.4 9.0 9.2 10.5 10.7 9.3 5.9 5.8
5.1 5.4 5.1 4.4 4.5 4.5 5.5 5.4 5.2 4.7 5.1 5.8 5.4 5.3 5.5 6.5 13.7 20.0 23.9 21.9 16.6 17.5 10.7 10.3 10.9 10.1 10.8 12.9 16.0 10.8 4.6 5.2
6.0 5.3 4.9 4.8 5.2 5.4 4.9 4.7 4.6 4.7 4.8 5.4 6.4 6.9 11.8 10.6 13.1 13.8 12.2 16.6 14.6 12.9 7.9 12.4 8.8 11.4 17.2 12.4 4.0 9.5 5.4
5.7 6.5 5.6 6.1 6.2 7.0 5.2 4.8 4.5 4.8 4.6 4.2 4.7 4.9 5.7 7.0 5.5 5.3 6.7 9.8 9.0 4.3 3.6 4.2 4.1 3.8 5.2 4.8 5.0 3.4
4.8 4.9 5.6 5.2 5.8 5.0 5.5 6.3 6.0 5.5 3.8 4.5 4.3 4.4 4.3 4.0 4.7 3.9 5.1 3.9 5.1 3.4 5.1 4.0 3.4 3.5 3.3 4.8
4.7 4.7 4.4 4.6 4.7 4.9 4.6 5.7 4.2 3.9 4.8 4.9 4.1 4.4 4.5 9.8 11.9 11.1 9.4 4.6 5.4 3.8 3.7 3.2 3.1 3.4 4.6 5.7 4.2 4.5
4.9 6.0 4.8 4.2 4.6 4.2 3.9 4.5 3.7 4.2 4.2 5.3 4.7 5.0 5.6 4.1 6.1 10.3 12.9 14.3 10.9 5.8 7.1 7.5 5.6 8.6 6.6 9.0 9.7 4.0 4.7
4.4 4.1 4.3 4.7 6.6 4.9 5.1 4.0 4.4 4.4 5.0 5.0 4.4 4.8 5.9 6.0 11.2 9.7 11.7 13.1 14.0 9.7 8.9 6.9 6.7 6.7 6.6 7.9 16.8 13.9 4.3 4.7
3.9 3.9 3.7 4.5 5.9 4.5 4.4 4.3 4.2 4.3 5.9 5.1 4.5 4.9 5.7 6.9 9.5 8.5 8.2 9.5 10.8 10.5 9.9 9.8 8.5 7.7 8.4 7.8 7.0 4.1
10.0 9.0 9.4 9.7 9.2 10.0 8.9 9.2 9.7 10.7 9.4 8.8 10.4 9.3

Figure 20. SATOB 101 - 400 hPa mean daily count. JANUARY 2004
Global average number of observations in 24 hours = 244696



		0	1	6	7	0			0	0	1	1				2	3	3	1			0	0	0											
46	105	79	76	112	103	138	132	57	33	29	43	78	38	73	360	805	931	1048	611	422	783	449	276	210	142	80	32					0	0	1	0
349	423	265	288	321	391	474	359	392	165	108	106	85	298	1558	2407	2338	1959	1650	1320	1813	2648	1534	670	289	360	276	172	79	7	3	1	4	6	10	49
300	600	557	655	620	607	660	683	939	445	302	275	333	1413	3486	3007	2002	1220	1353	1929	2120	1985	1694	1534	888	637	665	594	465	212	38	13	10	21	44	158
177	319	530	597	545	418	713	1302	1015	500	242	186	231	837	1860	1439	1541	2331	2616	2537	2592	2452	2707	1909	872	403	282	274	315	321	30	30	35	36	43	136
306	234	346	307	206	185	578	1362	250	76	75	67	161	305	562	855	1361	1966	1875	1783	1676	1098	689	380	257	414	462	437	368	311	53	15	20	14	12	36
589	481	331	247	165	260	247	359	118	217	512	686	1039	1288	1837	1182	974	718	1478	2260	2119	1740	775	764	909	905	1059	1098	926	777	235	50	48	42	36	22
731	885	768	494	289	228	47	30	22	111	808	850	1450	1580	1794	708	365	317	1135	2056	2088	1954	1593	1625	1341	1405	1190	1041	979	731	208	36	34	33	21	14
632	727	865	719	577	517	102	104	90	53	535	693	1299	1825	1843	808	197	276	716	2067	2142	1948	2098	2035	1257	809	493	475	441	454	92	20	25	25	31	97
217	355	577	571	442	744	567	207	119	89	146	266	524	1239	1623	1296	271	189	187	561	1398	1256	1153	1268	1014	775	572	334	183	120	21	26	45	50	62	200
207	236	454	481	291	401	815	431	296	197	99	269	342	763	978	1022	541	310	194	318	645	1201	1192	762	700	570	528	366	256	109	45	43	36	70	115	300
95	71	100	109	65	89	218	155	148	151	118	163	185	325	514	489	498	513	493	560	859	873	744	615	556	543	519	425	247	16	16	42	42	56	49	90
													1	63	167	185	194	196	160	175	221	203	278	332	300	232	126								
																1	1	1	0																

Figure 21. SATOB 101 - 400 hPa vector mean wind. JANUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

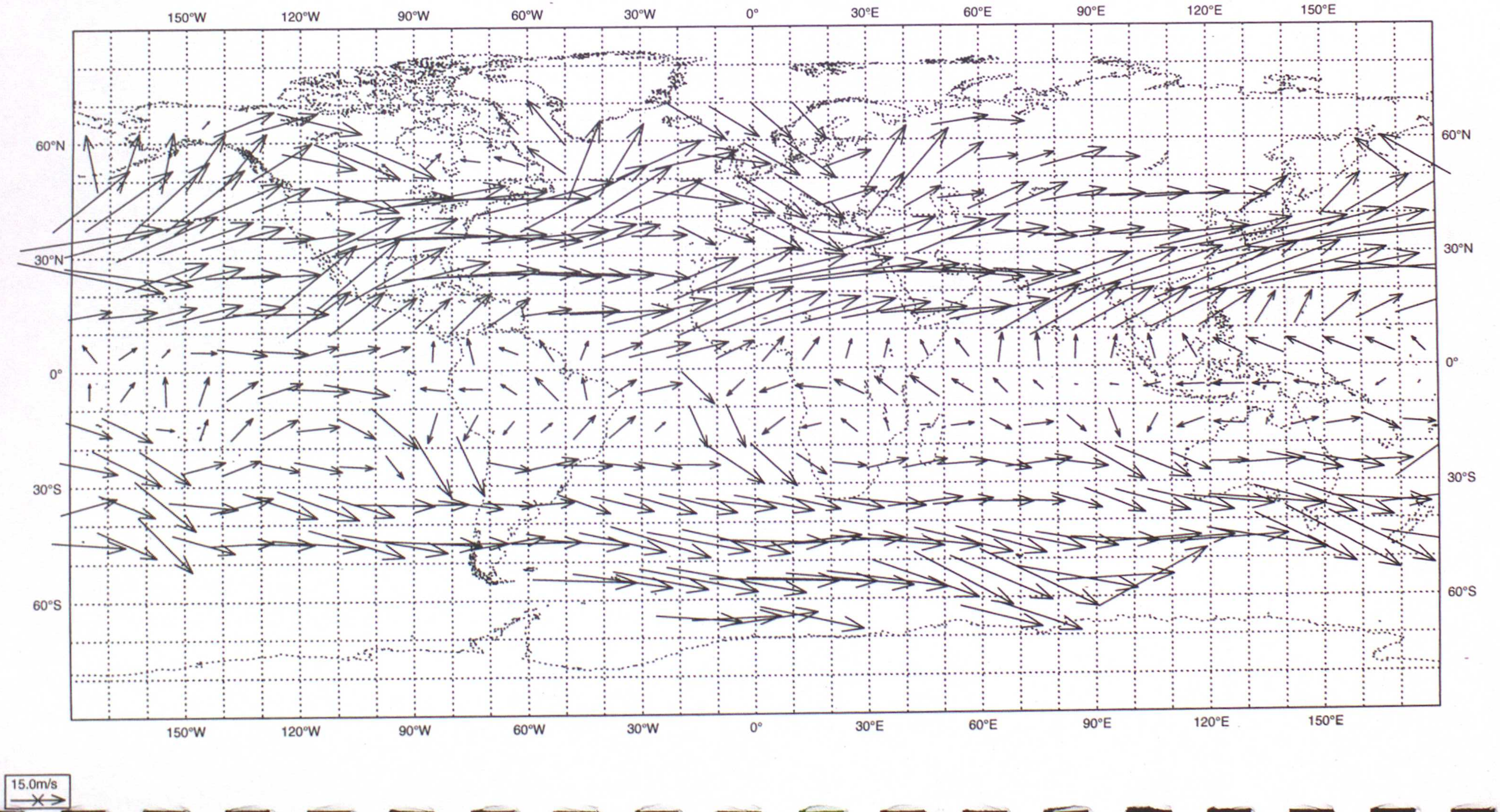

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. JANUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

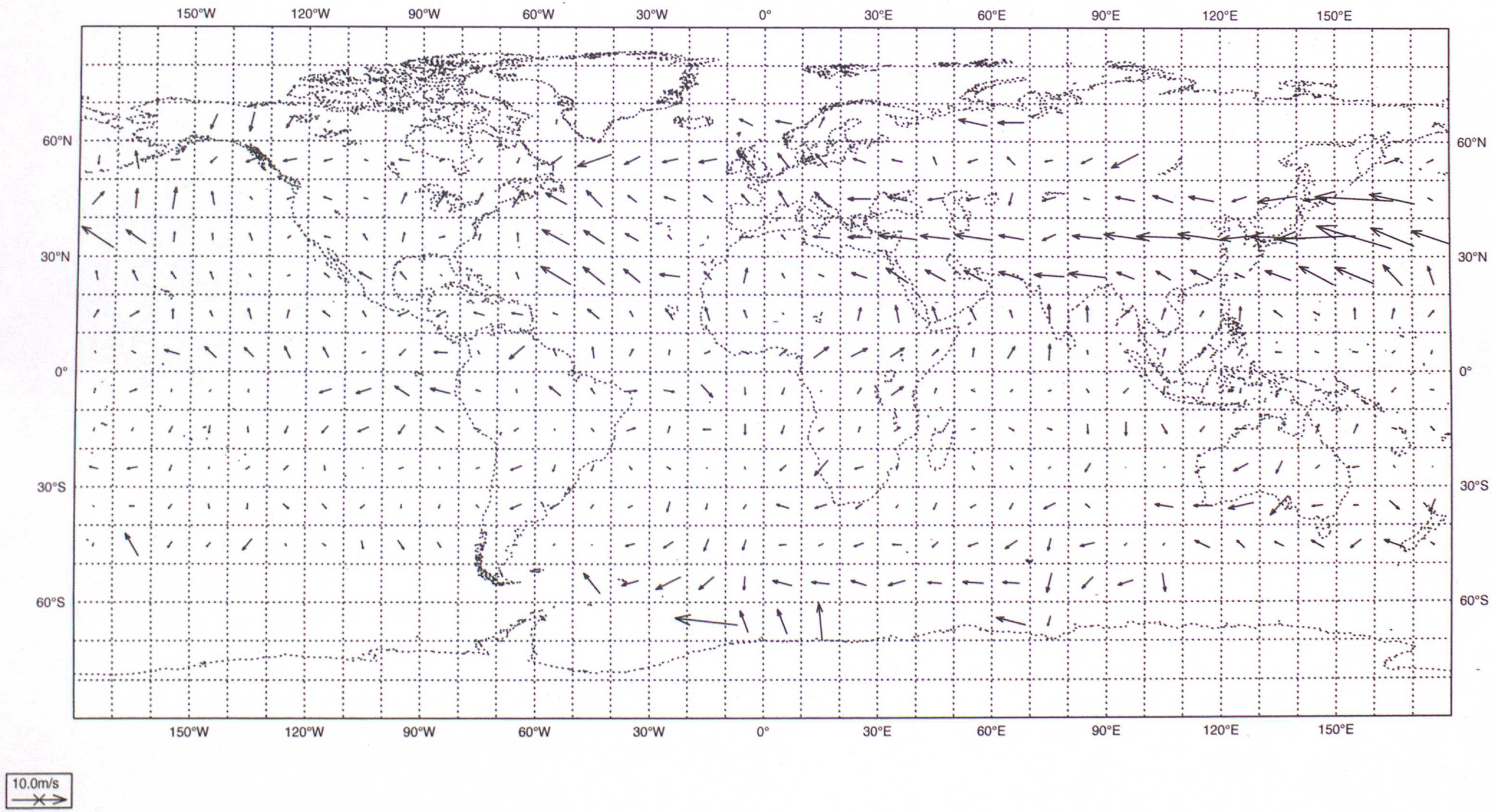

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). JANUARY 2004
All observations
Values are plotted where greater than 10 obs are present

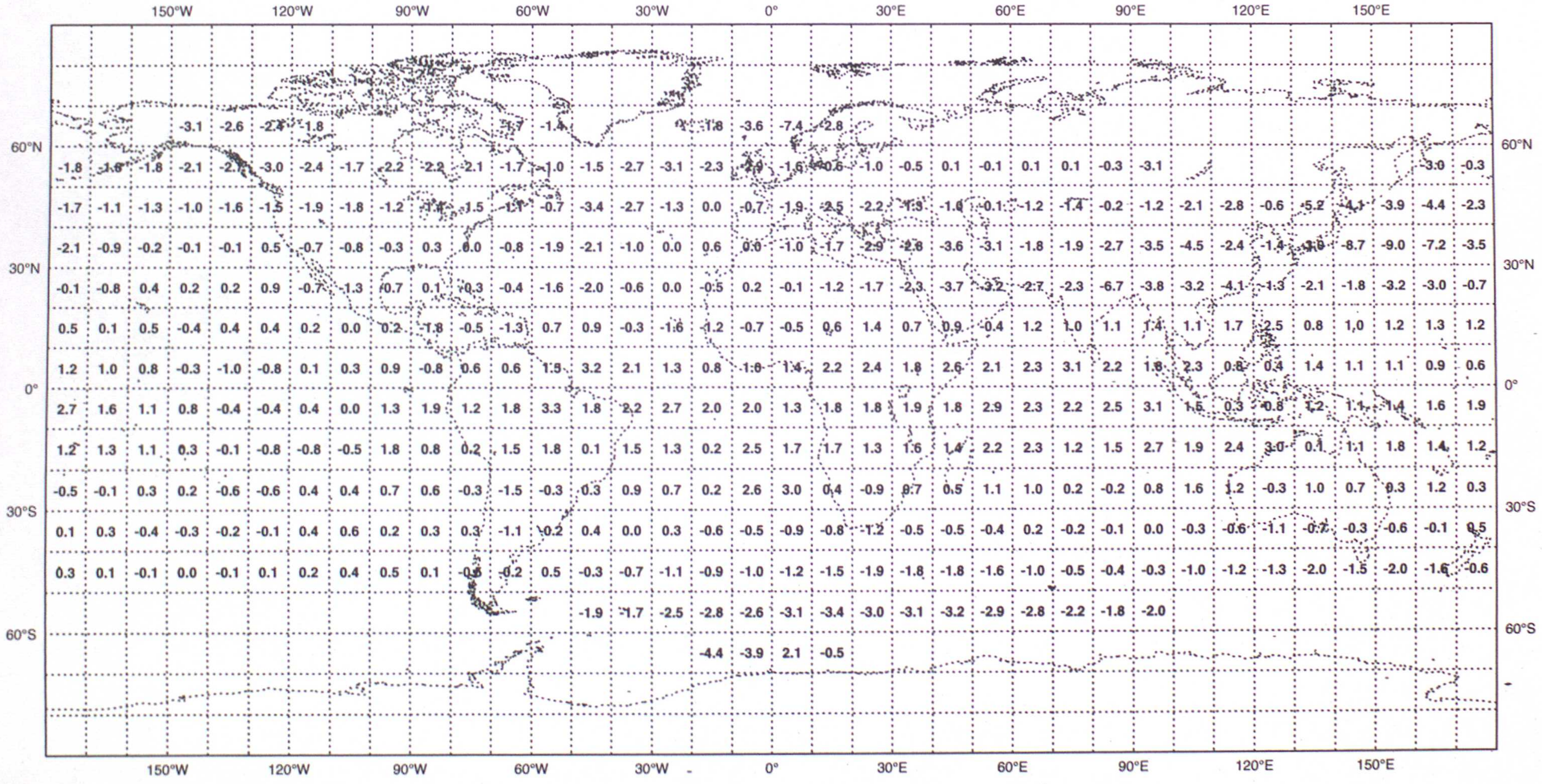
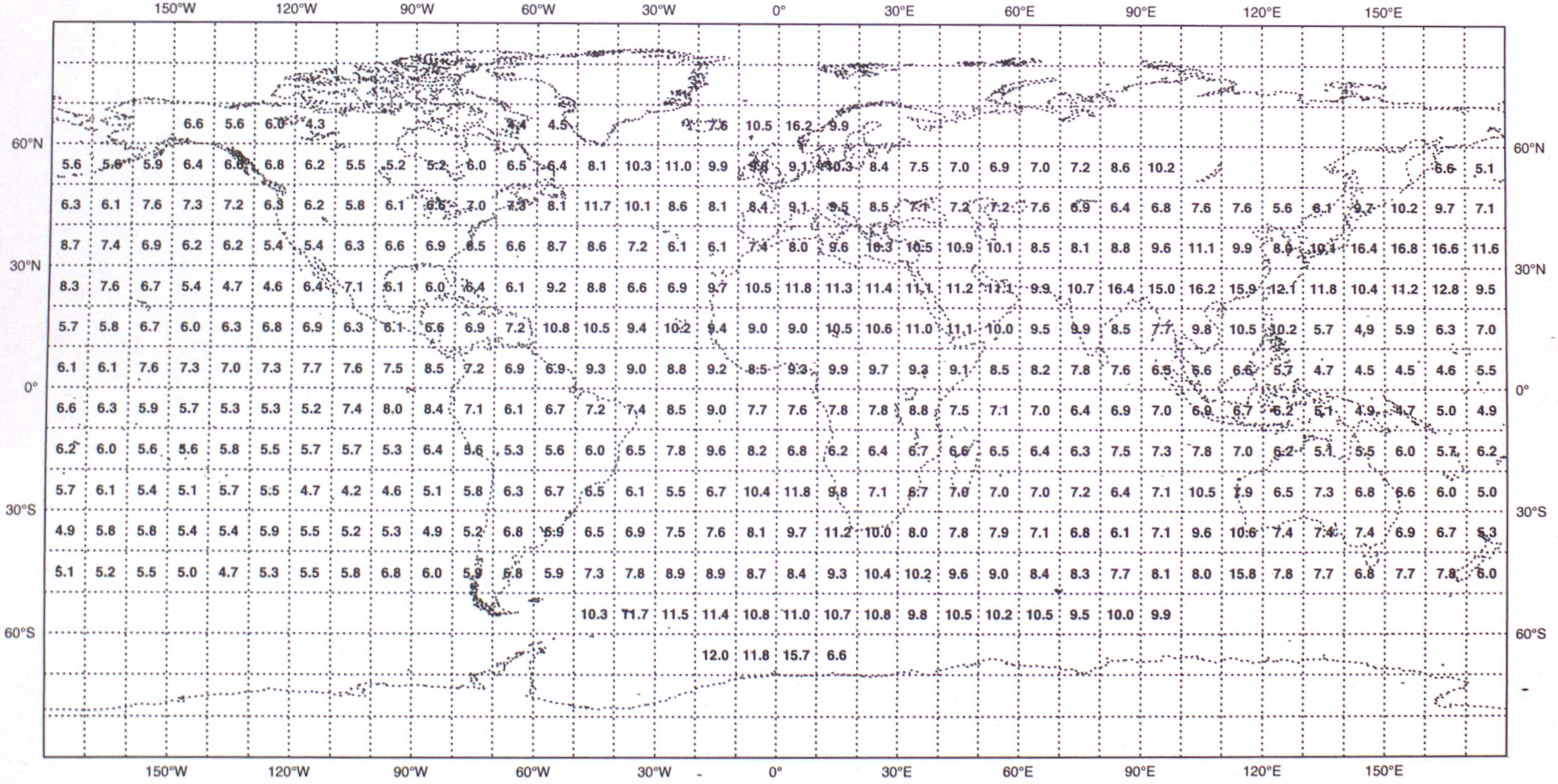

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-3.1 -2.6 -2.4 -1.8 -1.7 -1.4 -1.8 -3.6 -7.4 -2.8
-1.8 -1.8 -1.8 -2.1 -2.1 -3.0 -2.4 -1.7 -2.2 -2.2 -2.1 -1.7 -1.0 -1.5 -2.7 -3.1 -2.3 -2.9 -1.6 -0.6 -1.0 -0.5 0.1 -0.1 0.1 0.1 -0.3 -3.1 -3.0 -0.3
-1.7 -1.1 -1.3 -1.0 -1.6 -1.5 -1.9 -1.8 -1.2 -1.4 -1.5 -1.1 -0.7 -3.4 -2.7 -1.3 0.0 -0.7 -1.9 -2.5 -2.2 -1.3 -1.0 -0.1 -1.2 -1.4 -0.2 -1.2 -2.1 -2.8 -0.6 -5.2 -4.1 -3.9 -4.4 -2.3
-2.1 -0.9 -0.2 -0.1 -0.1 0.5 -0.7 -0.8 -0.3 0.3 0.0 -0.8 -1.9 -2.1 -1.0 0.0 0.6 0.0 -1.0 -1.7 -2.9 -2.8 -3.6 -3.1 -1.8 -1.9 -2.7 -3.5 -4.5 -2.4 -1.4 -3.0 -8.7 -9.0 -7.2 -3.5
-0.1 -0.8 0.4 0.2 0.2 0.9 -0.7 -1.3 0.7 0.1 0.3 -0.4 -1.6 -2.0 -0.6 0.0 -0.5 0.2 -0.1 -1.2 -1.7 -2.3 -3.7 -3.2 -2.7 -2.3 -6.7 -3.8 -3.2 -4.1 -1.3 -2.1 -1.8 -3.2 -3.0 -0.7
0.5 0.1 0.5 -0.4 0.4 0.4 0.2 0.0 0.2 -1.8 -0.5 -1.3 0.7 0.9 -0.3 -1.6 -1.2 -0.7 -0.5 0.6 1.4 0.7 0.9 -0.4 1.2 1.0 1.1 1.4 1.1 1.7 2.5 0.8 1,0 1.2 1.3 1.2
1.2 1.0 0.8 -0.3 -1.0 -0.8 0.1 0.3 0.9 -0.8 0.6 0.6 1.5 3.2 2.1 1.3 0.8 -1.0 1.4 2.2 2.4 1.8 2.6 2.1 2.3 3.1 2.2 1.8 2.3 0.8 0.4 1.4 1.1 1.1 0.9 0.6
2.7 1.6 1.1 0.8 -0.4 -0.4 0.4 0.0 1.3 1.9 1.2 1.8 3.3 1.8 2.2 2.7 2.0 2.0 1.3 1.8 1.8 1.9 1.8 2.9 2.3 2.2 2.5 3.1 1.5 0.3 -0.8 1.2 1.1 1.4 1.6 1.9
1.2 1.3 1.1 0.3 -0.1 -0.8 -0.8 -0.5 1.8 0.8 0.2 1.5 1.8 0.1 1.5 1.3 0.2 2.5 1.7 1.7 1.3 1.6 1.4 2.2 2.3 1.2 1.5 2.7 1.9 2.4 3.0 0.1 1.1 1.8 1.4 1.2
-0.5 -0.1 0.3 0.2 -0.6 -0.6 0.4 0.4 0.7 0.6 -0.3 -1.5 -0.3 0.3 0.9 0.7 0.2 2.6 3.0 0.4 -0.9 0.7 0.5 1.1 1.0 0.2 -0.2 0.8 1.6 1.2 -0.3 1.0 0.7 0.3 1.2 0.3
0.1 0.3 -0.4 -0.3 -0.2 -0.1 0.4 0.6 0.2 0.3 0.3 -1.1 0.2 0.4 0.0 0.3 -0.6 -0.5 -0.9 -0.8 -1.2 -0.5 -0.5 -0.4 0.2 -0.2 -0.1 0.0 -0.3 -0.6 -1.1 -0.7 -0.3 -0.6 -0.1 0.5
0.3 0.1 -0.1 0.0 -0.1 0.1 0.2 0.4 0.5 0.1 -0.5 -0.2 0.5 -0.3 -0.7 -1.1 -0.9 -1.0 -1.2 -1.5 -1.9 -1.8 -1.8 -1.6 -1.0 -0.5 -0.4 -0.3 -1.0 -1.2 -1.3 -2.0 -1.5 -2.0 -1.6 -0.6
-1.9 -1.7 -2.5 -2.8 -2.6 -3.1 -3.4 -3.0 -3.1 -3.2 -2.9 -2.8 -2.2 -1.8 -2.0
-4.4 -3.9 2.1 -0.5

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). JANUARY 2004
All observations
Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
6.6 5.6 6.0 4.3 4.4 4.5 7.6 10.5 16.2 9.9
5.6 5.6 5.9 6.4 6.6 6.8 6.2 5.5 5.2 5.2 6.0 6.5 6.4 8.1 10.3 11.0 9.9 9.8 9.1 10.3 8.4 7.5 7.0 6.9 7.0 7.2 8.6 10.2 6.6 5.1
6.3 6.1 7.6 7.3 7.2 6.3 6.2 5.8 6.1 6.6 7.0 7.3 8.1 11.7 10.1 8.6 8.1 8.4 9.1 9.5 8.5 7.1 7.2 7.2 7.6 6.9 6.4 6.8 7.6 7.6 5.6 8.1 9.7 10.2 9.7 7.1
8.7 7.4 6.9 6.2 6.2 5.4 5.4 6.3 6.6 6.9 6.5 6.6 8.7 8.6 7.2 6.1 6.1 7.4 8.0 9.6 10.3 10.5 10.9 10.1 8.5 8.1 8.8 9.6 11.1 9.9 8.9 10.1 16.4 16.8 16.6 11.6
8.3 7.6 6.7 5.4 4.7 4.6 6.4 7.1 6.1 6.0 6.4 6.1 9.2 8.8 6.6 6.9 9.7 10.5 11.8 11.3 11.4 11.1 11.2 11.1 9.9 10.7 16.4 15.0 16.2 15.9 12.1 11.8 10.4 11.2 12.8 9.5
5.7 5.8 6.7 6.0 6.3 6.8 6.9 6.3 6.1 6.6 6.9 7.2 10.8 10.5 9.4 10.2 9.4 9.0 9.0 10.5 10.6 11.0 11.1 10.0 9.5 9.9 8.5 7.7 9.8 10.5 10.2 5.7 4,9 5.9 6.3 7.0
6.1 6.1 7.6 7.3 7.0 7.3 7.7 7.6 7.5 8.5 7.2 6.9 6.9 9.3 9.0 8.8 9.2 8.5 9.3 9.9 9.7 9.3 9.1 8.5 8.2 7.8 7.6 6.5 6.6 6.6 5.7 4.7 4.5 4.5 4.6 5.5
6.6 6.3 5.9 5.7 5.3 5.3 5.2 7.4 8.0 8.4 7.1 6.1 6.7 7.2 7.4 8.5 9.0 7.7 7.6 7.8 7.8 8.8 7.5 7.1 7.0 6.4 6.9 7.0 6.9 6.7 6.2 5.1 4.9 4.7 5.0 4.9
6.2 6.0 5.6 5.6 5.8 5.5 5.7 5.7 5.3 6.4 5.6 5.3 5.6 6.0 6.5 7.8 9.6 8.2 6.8 6.2 6.4 6.7 6.6 6.5 6.4 6.3 7.5 7.3 7.8 7.0 6.2 5.1 5.5 6.0 5.7 6.2
5.7 6.1 5.4 5.1 5.7 5.5 4.7 4.2 4.6 5.1 5.8 6.3 6.7 6.5 6.1 5.5 6.7 10.4 11.8 9.8 7.1 6.7 7.0 7.0 7.0 7.2 6.4 7.1 10.5 7.9 6.5 7.3 6.8 6.6 6.0 5.0
4.9 5.8 5.8 5.4 5.4 5.9 5.5 5.2 5.3 4.9 5.2 6.8 6.9 6.5 6.9 7.5 7.6 8.1 9.7 11.2 10.0 8.0 7.8 7.9 7.1 6.8 6.1 7.1 9.6 10.6 7.4 7.4 7.4 6.9 6.7 5.3
5.1 5.2 5.5 5.0 4.7 5.3 5.5 5.8 6.8 6.0 5.9 5.8 5.9 7.3 7.8 8.9 8.9 8.7 8.4 9.3 10.4 10.2 9.6 9.0 8.4 8.3 7.7 8.1 8.0 15.8 7.8 7.7 6.8 7.7 7.8 6.0
10.3 11.7 11.5 11.4 10.8 11.0 10.7 10.8 9.8 10.5 10.2 10.5 9.5 10.0 9.9
12.0 11.8 15.7 6.6
60°N 30°N 0° 30°S 60°S
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

MONITORING OF SATELLITE TEMPERATURES

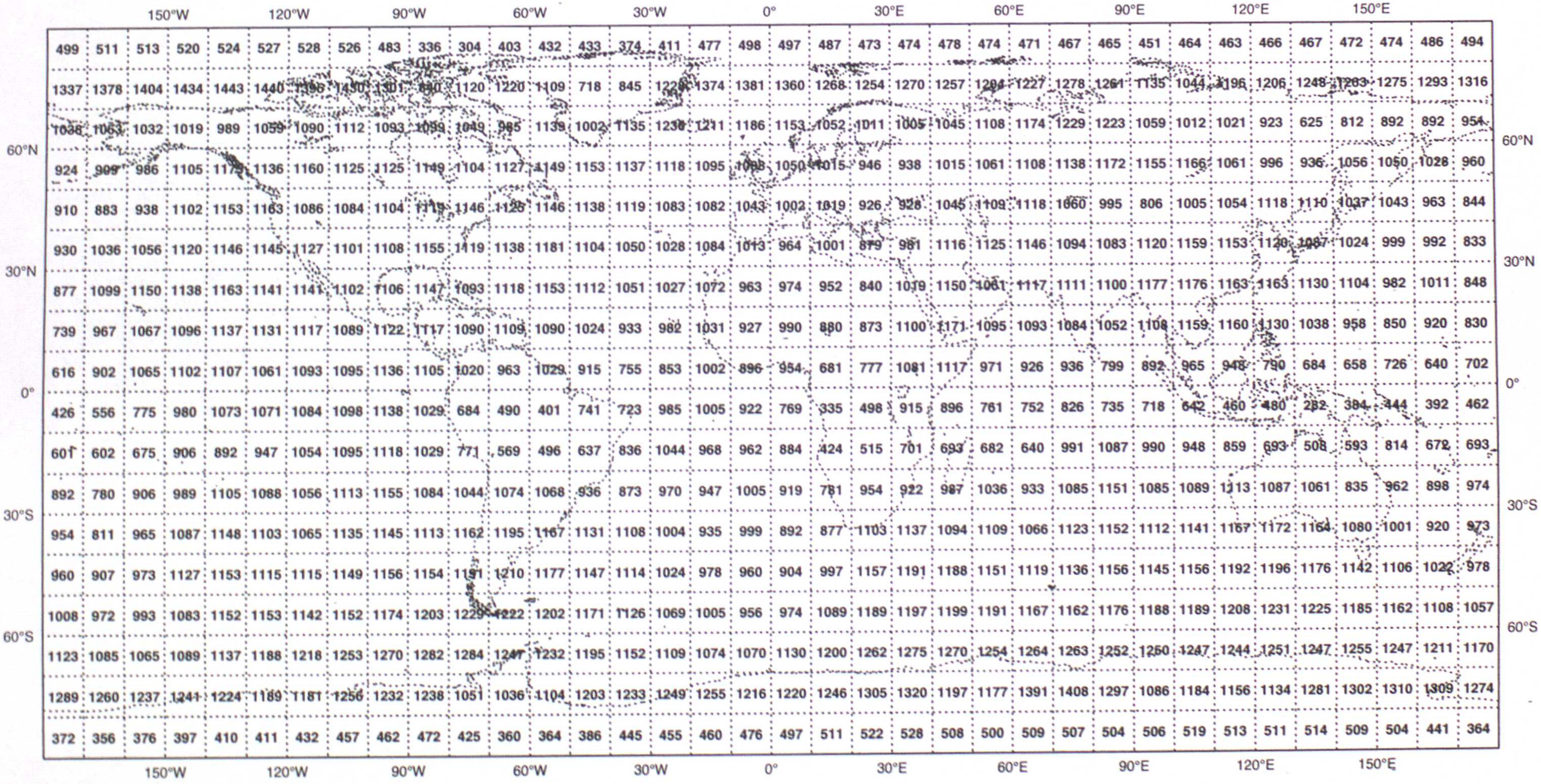
MONITORING CENTRE: EXETER

MONTH: Jan 2004

Monitoring procedures

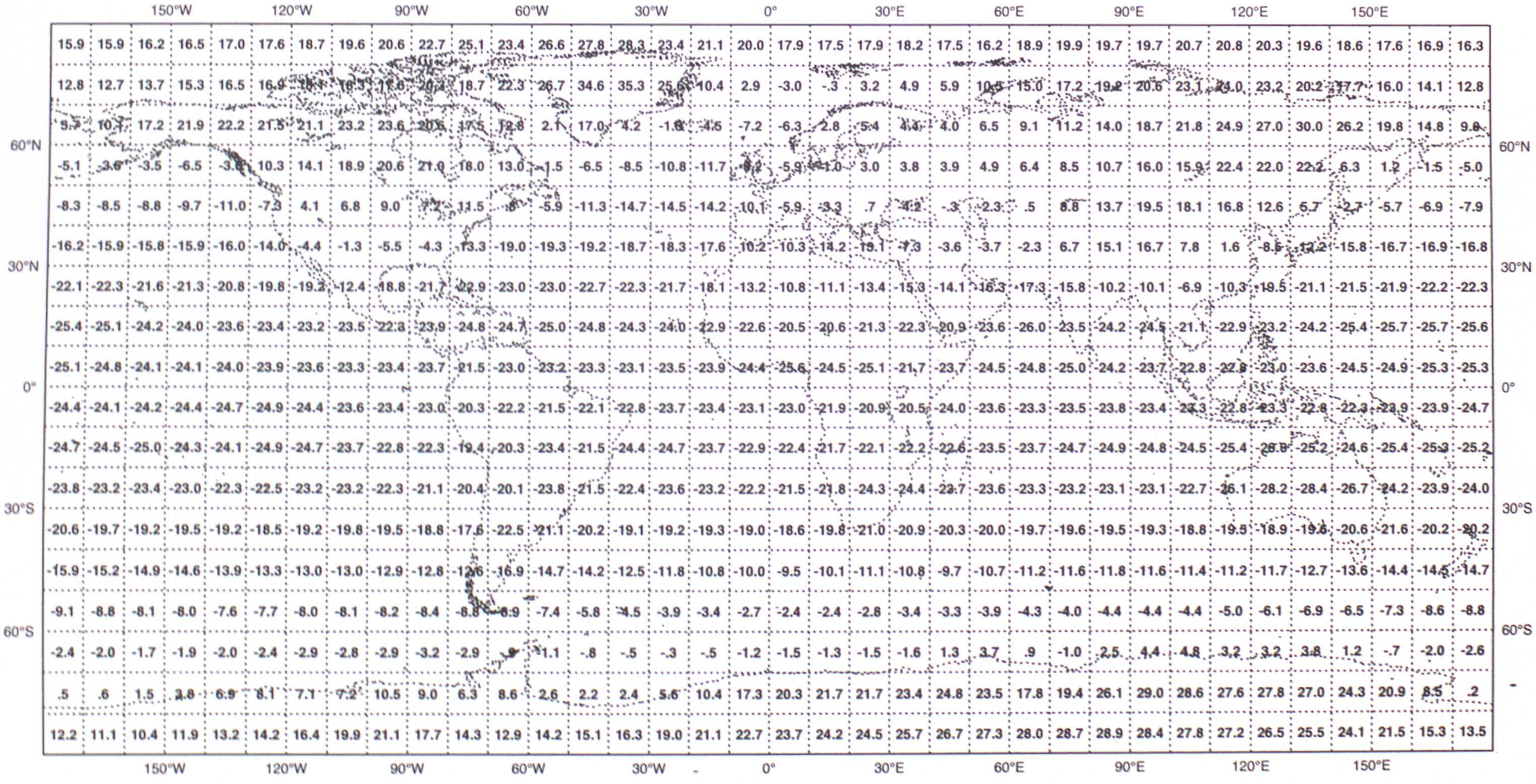
Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100) :Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. JANUARY 2004
NOAA15, using all observations
Global average number of observations in 24 hours = 636741



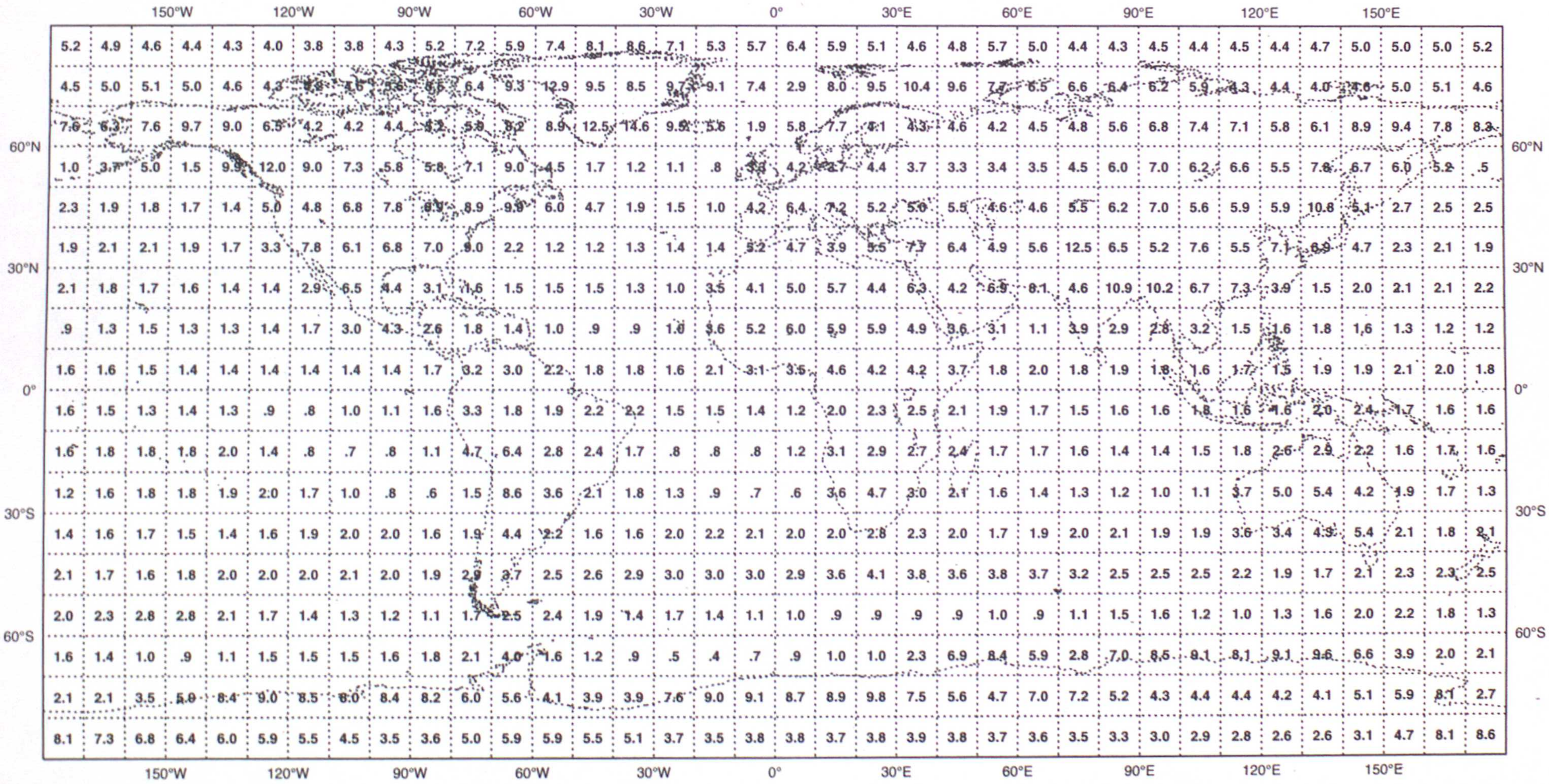
499	511	513	520	524	527	528	526	483	336	304	403	432	433	374	411	477	498	497	487	473	474	478	474	471	467	465	451	464	463	466	467	472	474	486	494
1337	1378	1404	1434	1443	1440	1396	1430	1301	840	1120	1220	1109	718	845	1228	1374	1381	1360	1268	1254	1270	1257	1284	1227	1278	1261	1135	1044	1196	1206	1248	1263	1275	1293	1316
1036	1063	1032	1019	989	1059	1090	1112	1093	1099	1049	985	1139	1002	1135	1238	1211	1186	1153	1052	1011	1005	1045	1108	1174	1229	1223	1059	1012	1021	923	625	812	892	892	954
924	909	986	1105	1175	1136	1160	1125	1125	1149	1104	1127	1149	1153	1137	1118	1095	1088	1050	1015	946	938	1015	1061	1108	1138	1172	1155	1166	1061	996	936	1056	1050	1028	960
910	883	938	1102	1153	1163	1086	1084	1104	1119	1146	1125	1146	1138	1119	1083	1082	1043	1002	1019	926	928	1045	1109	1118	1060	995	806	1005	1054	1118	1110	1037	1043	963	844
930	1036	1056	1120	1146	1145	1127	1101	1108	1155	1119	1138	1181	1104	1050	1028	1084	1013	964	1001	879	981	1116	1125	1146	1094	1083	1120	1159	1153	1120	1087	1024	999	992	833
877	1099	1150	1138	1163	1141	1141	1102	1106	1147	1093	1118	1153	1112	1051	1027	1072	963	974	952	840	1019	1150	1061	1117	1111	1100	1177	1176	1163	1163	1130	1104	982	1011	848
739	967	1067	1096	1137	1131	1117	1089	1122	1117	1090	1109	1090	1024	933	982	1031	927	990	880	873	1100	1171	1095	1093	1084	1052	1108	1159	1160	1130	1038	958	850	920	830
616	902	1065	1102	1107	1061	1093	1095	1136	1105	1020	963	1029	915	755	853	1002	896	954	681	777	1081	1117	971	926	936	799	892	965	948	790	684	658	726	640	702
426	556	775	980	1073	1071	1084	1098	1138	1029	684	490	401	741	723	985	1005	922	769	335	498	915	896	761	752	826	735	718	642	460	480	282	384	444	392	462
601	602	675	906	892	947	1054	1095	1118	1029	771	569	496	637	836	1044	968	962	884	424	515	701	693	682	640	991	1087	990	948	859	693	508	593	814	672	693
892	780	906	989	1105	1088	1056	1113	1155	1084	1044	1074	1068	936	873	970	947	1005	919	781	954	922	987	1036	933	1085	1151	1085	1089	1113	1087	1061	835	962	898	974
954	811	965	1087	1148	1103	1065	1135	1145	1113	1162	1195	1167	1131	1108	1004	935	999	892	877	1103	1137	1094	1109	1066	1123	1152	1112	1141	1167	1172	1164	1080	1001	920	973
960	907	973	1127	1153	1115	1115	1149	1156	1154	1191	1210	1177	1147	1114	1024	978	960	904	997	1157	1191	1188	1151	1119	1136	1156	1145	1156	1192	1196	1176	1142	1106	1022	978
1008	972	993	1083	1152	1153	1142	1152	1174	1203	1229	1222	1202	1171	1126	1069	1005	956	974	1089	1189	1197	1199	1191	1167	1162	1176	1188	1189	1208	1231	1225	1185	1162	1108	1057
1123	1085	1065	1089	1137	1188	1218	1253	1270	1282	1284	1247	1232	1195	1152	1109	1074	1070	1130	1200	1262	1275	1270	1254	1264	1263	1252	1250	1247	1244	1251	1247	1255	1247	1211	1170
1289	1260	1237	1241	1224	1189	1181	1256	1232	1238	1051	1036	1104	1203	1233	1249	1255	1216	1220	1246	1305	1320	1197	1177	1391	1408	1297	1086	1184	1156	1134	1281	1302	1310	1309	1274
372	356	376	397	410	411	432	457	462	472	425	360	364	386	445	455	460	476	497	511	522	528	508	500	509	507	504	506	519	513	511	514	509	504	441	364

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



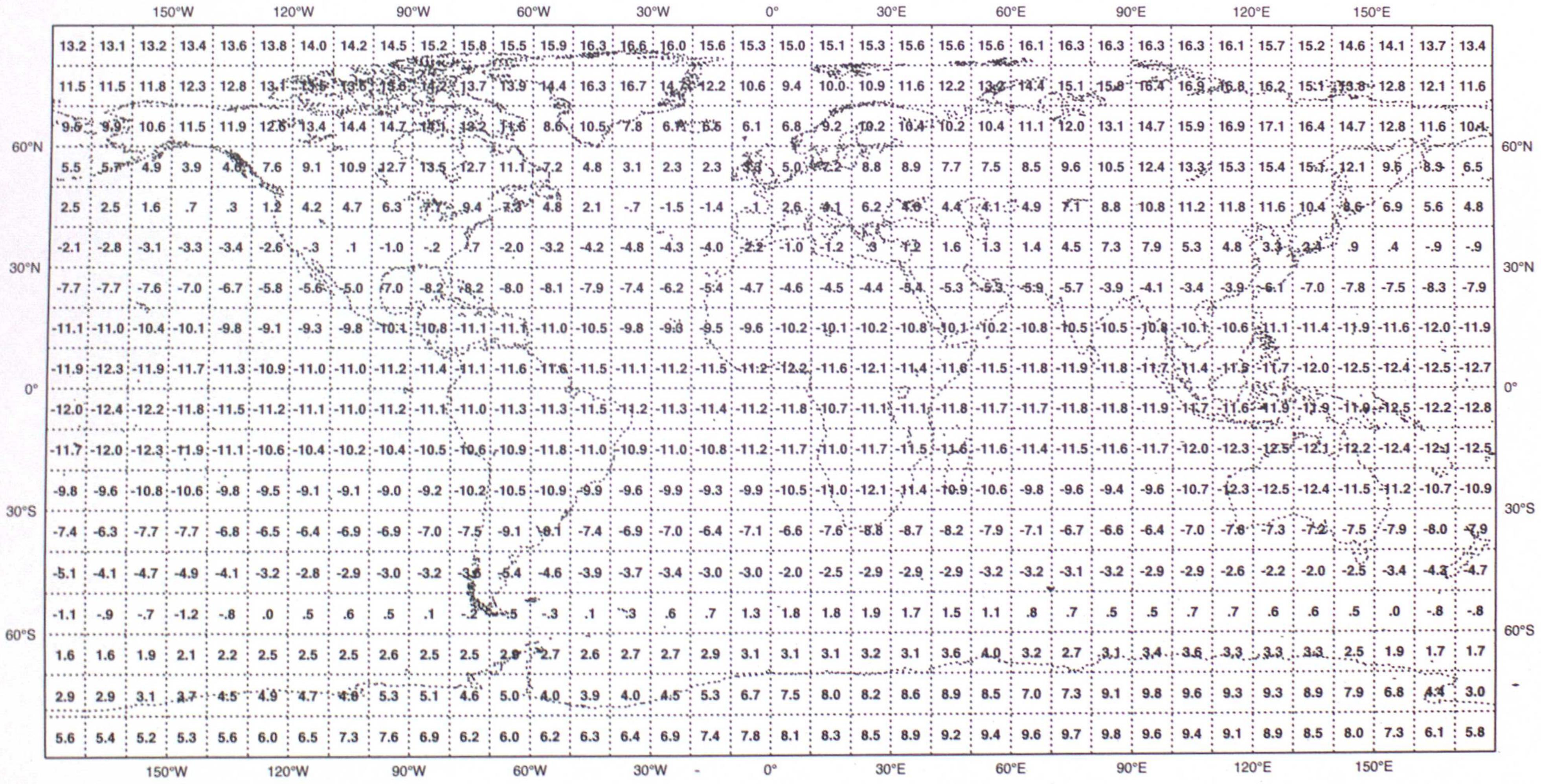
15.9	15.9	16.2	16.5	17.0	17.6	18.7	19.6	20.6	22.7	25.1	23.4	26.6	27.8	28.3	23.4	21.1	20.0	17.9	17.5	17.9	18.2	17.5	16.2	18.9	19.9	19.7	19.7	20.7	20.8	20.3	19.6	18.6	17.6	16.9	16.3
12.8	12.7	13.7	15.3	16.5	16.9	[illegible]	16.3	17.6	20.4	18.7	22.3	26.7	34.6	35.3	25.6	10.4	2.9	-3.0	-.3	3.2	4.9	5.9	10.5	15.0	17.2	19.2	20.6	23.1	24.0	23.2	20.2	17.7	16.0	14.1	12.8
9.7	10.7	17.2	21.9	22.2	21.5	21.1	23.2	23.6	20.6	17.5	12.8	2.1	17.0	4.2	-1.8	-4.5	-7.2	-6.3	2.8	5.4	4.4	4.0	6.5	9.1	11.2	14.0	18.7	21.8	24.9	27.0	30.0	26.2	19.8	14.8	9.8
-5.1	-3.6	-3.5	-6.5	-3.8	10.3	14.1	18.9	20.6	21.0	18.0	13.0	-1.5	-6.5	-8.5	-10.8	-11.7	-8.2	-5.9	-1.0	3.0	3.8	3.9	4.9	6.4	8.5	10.7	16.0	15.9	22.4	22.0	22.2	6.3	1.2	-1.5	-5.0
-8.3	-8.5	-8.8	-9.7	-11.0	-7.3	4.1	6.8	9.0	7.2	11.5	.8	-5.9	-11.3	-14.7	-14.5	-14.2	-10.1	-5.9	-3.3	.7	4.2	-.3	-2.3	.5	8.8	13.7	19.5	18.1	16.8	12.6	5.7	-2.7	-5.7	-6.9	-7.9
-16.2	-15.9	-15.8	-15.9	-16.0	-14.0	-4.4	-1.3	-5.5	-4.3	-13.3	-19.0	-19.3	-19.2	-18.7	-18.3	-17.6	-10.2	-10.3	-14.2	-19.1	-7.3	-3.6	-3.7	-2.3	6.7	15.1	16.7	7.8	1.6	-8.5	-12.2	-15.8	-16.7	-16.9	-16.8
-22.1	-22.3	-21.6	-21.3	-20.8	-19.8	-19.2	-12.4	-18.8	-21.7	-22.9	-23.0	-23.0	-22.7	-22.3	-21.7	-18.1	-13.2	-10.8	-11.1	-13.4	-15.3	-14.1	-16.3	-17.3	-15.8	-10.2	-10.1	-6.9	-10.3	-19.5	-21.1	-21.5	-21.9	-22.2	-22.3
-25.4	-25.1	-24.2	-24.0	-23.6	-23.4	-23.2	-23.5	-22.8	-23.9	-24.8	-24.7	-25.0	-24.8	-24.3	-24.0	-22.9	-22.6	-20.5	-20.6	-21.3	-22.3	-20.9	-23.6	-26.0	-23.5	-24.2	-24.5	-21.1	-22.9	-23.2	-24.2	-25.4	-25.7	-25.7	-25.6
-25.1	-24.8	-24.1	-24.1	-24.0	-23.9	-23.6	-23.3	-23.4	-23.7	-21.5	-23.0	-23.2	-23.3	-23.1	-23.5	-23.9	-24.4	-25.6	-24.5	-25.1	-21.7	-23.7	-24.5	-24.8	-25.0	-24.2	-23.7	-22.8	-22.8	-23.0	-23.6	-24.5	-24.9	-25.3	-25.3
-24.4	-24.1	-24.2	-24.4	-24.7	-24.9	-24.4	-23.6	-23.4	-23.0	-20.3	-22.2	-21.5	-22.1	-22.8	-23.7	-23.4	-23.1	-23.0	-21.9	-20.9	-20.5	-24.0	-23.6	-23.3	-23.5	-23.8	-23.4	-23.3	-22.8	-23.3	-22.8	-22.3	-23.9	-23.9	-24.7
-24.7	-24.5	-25.0	-24.3	-24.1	-24.9	-24.7	-23.7	-22.8	-22.3	-19.4	-20.3	-23.4	-21.5	-24.4	-24.7	-23.7	-22.9	-22.4	-21.7	-22.1	-22.2	-22.6	-23.5	-23.7	-24.7	-24.9	-24.8	-24.5	-25.4	-26.8	-25.2	-24.6	-25.4	-25.3	-25.2
-23.8	-23.2	-23.4	-23.0	-22.3	-22.5	-23.2	-23.2	-22.3	-21.1	-20.4	-20.1	-23.8	-21.5	-22.4	-23.6	-23.2	-22.2	-21.5	-21.8	-24.3	-24.4	-23.7	-23.6	-23.3	-23.2	-23.1	-23.1	-22.7	-26.1	-28.2	-28.4	-26.7	-24.2	-23.9	-24.0
-20.6	-19.7	-19.2	-19.5	-19.2	-18.5	-19.2	-19.8	-19.5	-18.8	-17.6	-22.5	-21.1	-20.2	-19.1	-19.2	-19.3	-19.0	-18.6	-19.8	-21.0	-20.9	-20.3	-20.0	-19.7	-19.6	-19.5	-19.3	-18.8	-19.5	-18.9	-19.6	-20.6	-21.6	-20.2	-20.2
-15.9	-15.2	-14.9	-14.6	-13.9	-13.3	-13.0	-13.0	-12.9	-12.8	-12.6	-16.9	-14.7	-14.2	-12.5	-11.8	-10.8	-10.0	-9.5	-10.1	-11.1	-10.8	-9.7	-10.7	-11.2	-11.6	-11.8	-11.6	-11.4	-11.2	-11.7	-12.7	-13.6	-14.4	-14.5	-14.7
-9.1	-8.8	-8.1	-8.0	-7.6	-7.7	-8.0	-8.1	-8.2	-8.4	-8.8	-6.9	-7.4	-5.8	-4.5	-3.9	-3.4	-2.7	-2.4	-2.4	-2.8	-3.4	-3.3	-3.9	-4.3	-4.0	-4.4	-4.4	-4.4	-5.0	-6.1	-6.9	-6.5	-7.3	-8.6	-8.8
-2.4	-2.0	-1.7	-1.9	-2.0	-2.4	-2.9	-2.8	-2.9	-3.2	-2.9	.9	-1.1	-.8	-.5	-.3	-.5	-1.2	-1.5	-1.3	-1.5	-1.6	1.3	3.7	.9	-1.0	2.5	4.4	4.8	3.2	3.2	3.8	1.2	-.7	-2.0	-2.6
.5	.6	1.5	3.8	6.9	8.1	7.1	7.2	10.5	9.0	6.3	8.6	2.6	2.2	2.4	5.6	10.4	17.3	20.3	21.7	21.7	23.4	24.8	23.5	17.8	19.4	26.1	29.0	28.6	27.6	27.8	27.0	24.3	20.9	8.5	.2
12.2	11.1	10.4	11.9	13.2	14.2	16.4	19.9	21.1	17.7	14.3	12.9	14.2	15.1	16.3	19.0	21.1	22.7	23.7	24.2	24.5	25.7	26.7	27.3	28.0	28.7	28.9	28.4	27.8	27.2	26.5	25.5	24.1	21.5	15.3	13.5

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



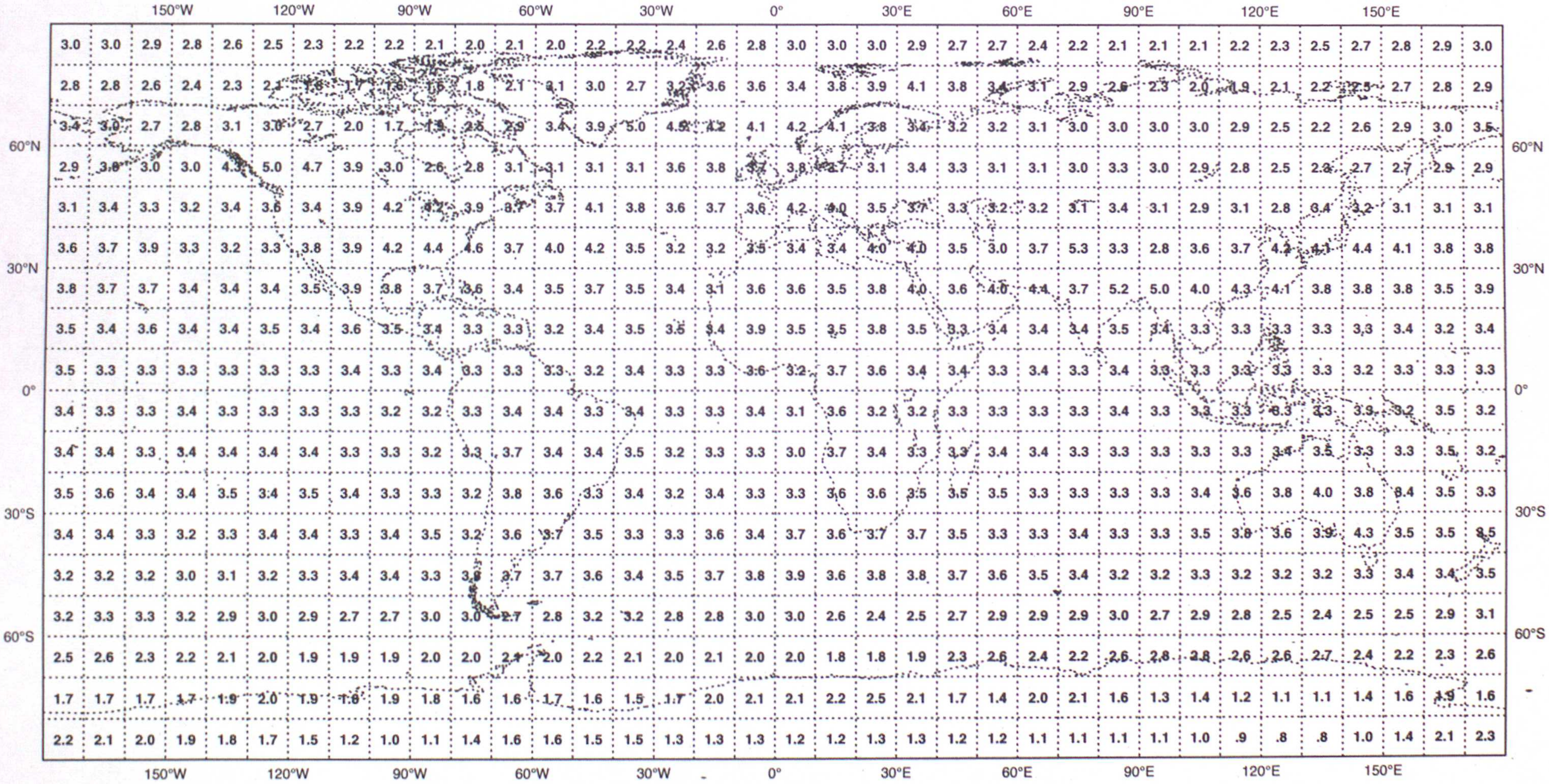
5.2	4.9	4.6	4.4	4.3	4.0	3.8	3.8	4.3	5.2	7.2	5.9	7.4	8.1	8.6	7.1	5.3	5.7	6.4	5.9	5.1	4.6	4.8	5.7	5.0	4.4	4.3	4.5	4.4	4.5	4.4	4.7	5.0	5.0	5.0	5.2
4.5	5.0	5.1	5.0	4.6	4.3	3.8	4.6	5.6	6.5	6.4	9.3	12.9	9.5	8.5	9.7	9.1	7.4	2.9	8.0	9.5	10.4	9.6	7.7	6.5	6.6	6.4	6.2	5.9	4.3	4.4	4.0	4.6	5.0	5.1	4.6
7.6	6.3	7.6	9.7	9.0	6.5	4.2	4.2	4.4	5.2	5.8	8.2	8.9	12.5	14.6	9.5	5.6	1.9	5.8	7.7	4.1	4.3	4.6	4.2	4.5	4.8	5.6	6.8	7.4	7.1	5.8	6.1	8.9	9.4	7.8	8.3
1.0	3.7	5.0	1.5	9.9	12.0	9.0	7.3	5.8	5.8	7.1	9.0	4.5	1.7	1.2	1.1	.8	3.3	4.2	2.7	4.4	3.7	3.3	3.4	3.5	4.5	6.0	7.0	6.2	6.6	5.5	7.8	6.7	6.0	5.2	.5
2.3	1.9	1.8	1.7	1.4	5.0	4.8	6.8	7.8	8.9	8.9	9.9	6.0	4.7	1.9	1.5	1.0	4.2	6.4	7.2	5.2	5.0	5.5	4.6	4.6	5.5	6.2	7.0	5.6	5.9	5.9	10.8	5.1	2.7	2.5	2.5
1.9	2.1	2.1	1.9	1.7	3.3	7.8	6.1	6.8	7.0	8.0	2.2	1.2	1.2	1.3	1.4	1.4	5.2	4.7	3.9	5.5	7.7	6.4	4.9	5.6	12.5	6.5	5.2	7.6	5.5	7.1	6.9	4.7	2.3	2.1	1.9
2.1	1.8	1.7	1.6	1.4	1.4	2.9	6.5	4.4	3.1	1.6	1.5	1.5	1.5	1.3	1.0	3.5	4.1	5.0	5.7	4.4	6.3	4.2	6.9	8.1	4.6	10.9	10.2	6.7	7.3	3.9	1.5	2.0	2.1	2.1	2.2
.9	1.3	1.5	1.3	1.3	1.4	1.7	3.0	4.3	2.6	1.8	1.4	1.0	.9	.9	1.0	3.6	5.2	6.0	5.9	5.9	4.9	3.6	3.1	1.1	3.9	2.9	2.8	3.2	1.5	1.6	1.8	1.6	1.3	1.2	1.2
1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.7	3.2	3.0	2.2	1.8	1.8	1.6	2.1	3.1	3.5	4.6	4.2	4.2	3.7	1.8	2.0	1.8	1.9	1.8	1.6	1.7	1.5	1.9	1.9	2.1	2.0	1.8
1.6	1.5	1.3	1.4	1.3	.9	.8	1.0	1.1	1.6	3.3	1.8	1.9	2.2	2.2	1.5	1.5	1.4	1.2	2.0	2.3	2.5	2.1	1.9	1.7	1.5	1.6	1.6	1.8	1.6	1.6	2.0	2.4	1.7	1.6	1.6
1.6	1.8	1.8	1.8	2.0	1.4	.8	.7	.8	1.1	4.7	6.4	2.8	2.4	1.7	.8	.8	.8	1.2	3.1	2.9	2.7	2.4	1.7	1.7	1.6	1.4	1.4	1.5	1.8	2.6	2.9	2.2	1.6	1.7	1.6
1.2	1.6	1.8	1.8	1.9	2.0	1.7	1.0	.8	.6	1.5	8.6	3.6	2.1	1.8	1.3	.9	.7	.6	3.6	4.7	3.0	2.1	1.6	1.4	1.3	1.2	1.0	1.1	3.7	5.0	5.4	4.2	1.9	1.7	1.3
1.4	1.6	1.7	1.5	1.4	1.6	1.9	2.0	2.0	1.6	1.9	4.4	2.2	1.6	1.6	2.0	2.2	2.1	2.0	2.0	2.8	2.3	2.0	1.7	1.9	2.0	2.1	1.9	1.9	3.6	3.4	4.3	5.4	2.1	1.8	2.1
2.1	1.7	1.6	1.8	2.0	2.0	2.0	2.1	2.0	1.9	2.9	3.7	2.5	2.6	2.9	3.0	3.0	3.0	2.9	3.6	4.1	3.8	3.6	3.8	3.7	3.2	2.5	2.5	2.5	2.2	1.9	1.7	2.1	2.3	2.3	2.5
2.0	2.3	2.8	2.8	2.1	1.7	1.4	1.3	1.2	1.1	1.7	2.5	2.4	1.9	1.4	1.7	1.4	1.1	1.0	.9	.9	.9	.9	1.0	.9	1.1	1.5	1.6	1.2	1.0	1.3	1.6	2.0	2.2	1.8	1.3
1.6	1.4	1.0	.9	1.1	1.5	1.5	1.5	1.6	1.8	2.1	4.0	1.6	1.2	.9	.5	.4	.7	.9	1.0	1.0	2.3	6.9	8.4	5.9	2.8	7.0	8.5	9.1	8.1	9.1	9.6	6.6	3.9	2.0	2.1
2.1	2.1	3.5	5.9	8.4	9.0	8.5	8.0	8.4	8.2	6.0	5.6	4.1	3.9	3.9	7.6	9.0	9.1	8.7	8.9	9.8	7.5	5.6	4.7	7.0	7.2	5.2	4.3	4.4	4.4	4.2	4.1	5.1	5.9	8.1	2.7
8.1	7.3	6.8	6.4	6.0	5.9	5.5	4.5	3.5	3.6	5.0	5.9	5.9	5.5	5.1	3.7	3.5	3.8	3.8	3.7	3.8	3.9	3.8	3.7	3.6	3.5	3.3	3.0	2.9	2.8	2.6	2.6	3.1	4.7	8.1	8.6

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



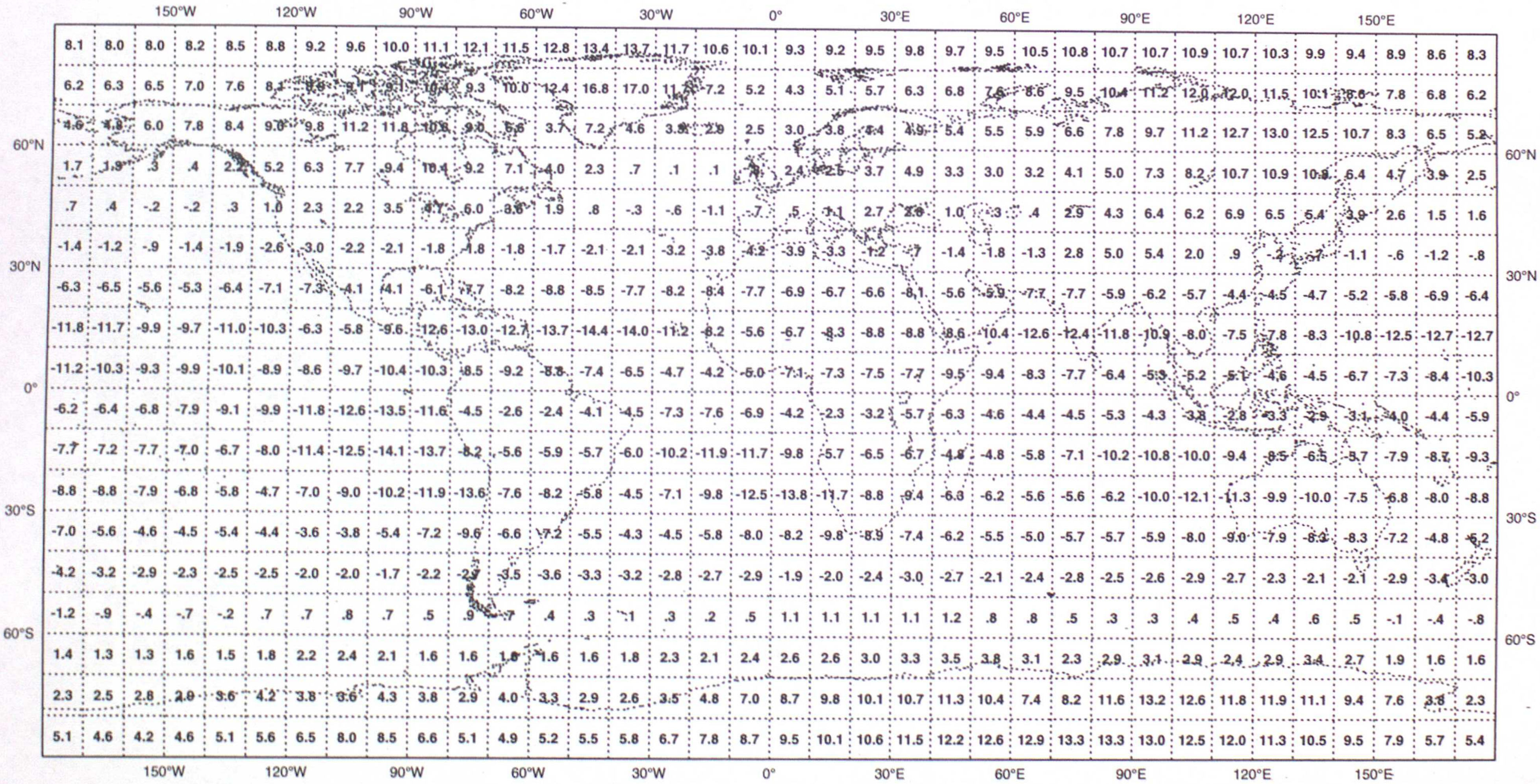
13.2	13.1	13.2	13.4	13.6	13.8	14.0	14.2	14.5	15.2	15.8	15.5	15.9	16.3	16.6	16.0	15.6	15.3	15.0	15.1	15.3	15.6	15.6	15.6	16.1	16.3	16.3	16.3	16.3	16.1	15.7	15.2	14.6	14.1	13.7	13.4
11.5	11.5	11.8	12.3	12.8	13.1	13.5	13.6	13.6	14.2	13.7	13.9	14.4	16.3	16.7	14.7	12.2	10.6	9.4	10.0	10.9	11.6	12.2	13.2	14.4	15.1	15.8	16.4	16.9	16.8	16.2	15.1	13.8	12.8	12.1	11.6
9.6	9.9	10.6	11.5	11.9	12.6	13.4	14.4	14.7	14.1	13.2	11.6	8.6	10.5	7.8	6.1	5.5	6.1	6.8	9.2	10.2	10.4	10.2	10.4	11.1	12.0	13.1	14.7	15.9	16.9	17.1	16.4	14.7	12.8	11.6	10.4
5.5	5.7	4.9	3.9	4.6	7.6	9.1	10.9	12.7	13.5	12.7	11.1	7.2	4.8	3.1	2.3	2.3	3.3	5.0	7.2	8.8	8.9	7.7	7.5	8.5	9.6	10.5	12.4	13.3	15.3	15.4	15.1	12.1	9.6	8.9	6.5
2.5	2.5	1.6	.7	.3	1.2	4.2	4.7	6.3	7.7	9.4	7.3	4.8	2.1	-.7	-1.5	-1.4	-.1	2.6	4.1	6.2	4.6	4.4	4.1	4.9	7.1	8.8	10.8	11.2	11.8	11.6	10.4	8.6	6.9	5.6	4.8
-2.1	-2.8	-3.1	-3.3	-3.4	-2.6	-.3	.1	-1.0	-.2	.7	-2.0	-3.2	-4.2	-4.8	-4.3	-4.0	-2.2	-1.0	-1.2	.3	1.2	1.6	1.3	1.4	4.5	7.3	7.9	5.3	4.8	3.3	2.4	.9	.4	-.9	-.9
-7.7	-7.7	-7.6	-7.0	-6.7	-5.8	-5.6	-5.0	-7.0	-8.2	-8.2	-8.0	-8.1	-7.9	-7.4	-6.2	-5.4	-4.7	-4.6	-4.5	-4.4	-5.4	-5.3	-5.3	-5.9	-5.7	-3.9	-4.1	-3.4	-3.9	-6.1	-7.0	-7.8	-7.5	-8.3	-7.9
-11.1	-11.0	-10.4	-10.1	-9.8	-9.1	-9.3	-9.8	-10.1	-10.8	-11.1	-11.1	-11.0	-10.5	-9.8	-9.8	-9.5	-9.6	-10.2	-10.1	-10.2	-10.8	-10.1	-10.2	-10.8	-10.5	-10.5	-10.8	-10.1	-10.6	-11.1	-11.4	-11.9	-11.6	-12.0	-11.9
-11.9	-12.3	-11.9	-11.7	-11.3	-10.9	-11.0	-11.0	-11.2	-11.4	-11.1	-11.6	-11.6	-11.5	-11.1	-11.2	-11.5	-11.2	-12.2	-11.6	-12.1	-11.4	-11.6	-11.5	-11.8	-11.9	-11.8	-11.7	-11.4	-11.5	-11.7	-12.0	-12.5	-12.4	-12.5	-12.7
-12.0	-12.4	-12.2	-11.8	-11.5	-11.2	-11.1	-11.0	-11.2	-11.1	-11.0	-11.3	-11.3	-11.5	-11.2	-11.3	-11.4	-11.2	-11.8	-10.7	-11.1	-11.1	-11.8	-11.7	-11.7	-11.8	-11.8	-11.9	-11.7	-11.6	-11.9	-11.9	-11.9	-12.5	-12.2	-12.8
-11.7	-12.0	-12.3	-11.9	-11.1	-10.6	-10.4	-10.2	-10.4	-10.5	-10.6	-10.9	-11.8	-11.0	-10.9	-11.0	-10.8	-11.2	-11.7	-11.0	-11.7	-11.5	-11.6	-11.6	-11.4	-11.5	-11.6	-11.7	-12.0	-12.3	-12.5	-12.1	-12.2	-12.4	-12.1	-12.5
-9.8	-9.6	-10.8	-10.6	-9.8	-9.5	-9.1	-9.1	-9.0	-9.2	-10.2	-10.5	-10.9	-9.9	-9.6	-9.9	-9.3	-9.9	-10.5	-11.0	-12.1	-11.4	-10.9	-10.6	-9.8	-9.6	-9.4	-9.6	-10.7	-12.3	-12.5	-12.4	-11.5	-11.2	-10.7	-10.9
-7.4	-6.3	-7.7	-7.7	-6.8	-6.5	-6.4	-6.9	-6.9	-7.0	-7.5	-9.1	-8.1	-7.4	-6.9	-7.0	-6.4	-7.1	-6.6	-7.6	-8.8	-8.7	-8.2	-7.9	-7.1	-6.7	-6.6	-6.4	-7.0	-7.8	-7.3	-7.2	-7.5	-7.9	-8.0	-7.9
-5.1	-4.1	-4.7	-4.9	-4.1	-3.2	-2.8	-2.9	-3.0	-3.2	-3.6	-5.4	-4.6	-3.9	-3.7	-3.4	-3.0	-3.0	-2.0	-2.5	-2.9	-2.9	-2.9	-3.2	-3.2	-3.1	-3.2	-2.9	-2.9	-2.6	-2.2	-2.0	-2.5	-3.4	-4.3	-4.7
-1.1	-.9	-.7	-1.2	-.8	.0	.5	.6	.5	.1	-.2	-.5	-.3	.1	.3	.6	.7	1.3	1.8	1.8	1.9	1.7	1.5	1.1	.8	.7	.5	.5	.7	.7	.6	.6	.5	.0	-.8	-.8
1.6	1.6	1.9	2.1	2.2	2.5	2.5	2.5	2.6	2.5	2.5	2.9	2.7	2.6	2.7	2.7	2.9	3.1	3.1	3.1	3.2	3.1	3.6	4.0	3.2	2.7	3.1	3.4	3.6	3.3	3.3	3.3	2.5	1.9	1.7	1.7
2.9	2.9	3.1	3.7	4.5	4.9	4.7	4.8	5.3	5.1	4.6	5.0	4.0	3.9	4.0	4.5	5.3	6.7	7.5	8.0	8.2	8.6	8.9	8.5	7.0	7.3	9.1	9.8	9.6	9.3	9.3	8.9	7.9	6.8	4.4	3.0
5.6	5.4	5.2	5.3	5.6	6.0	6.5	7.3	7.6	6.9	6.2	6.0	6.2	6.3	6.4	6.9	7.4	7.8	8.1	8.3	8.5	8.9	9.2	9.4	9.6	9.7	9.8	9.6	9.4	9.1	8.9	8.5	8.0	7.3	6.1	5.8

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



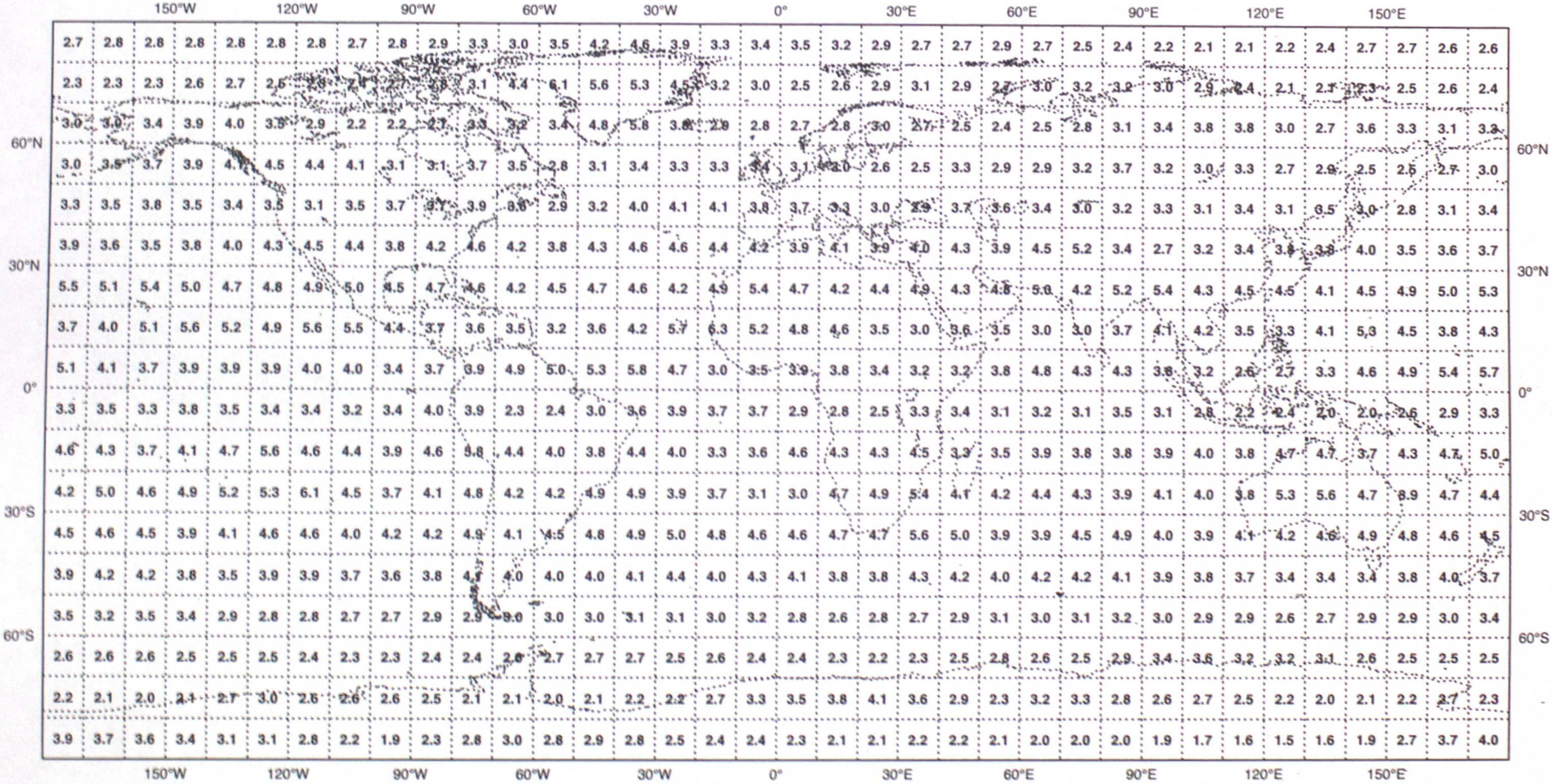
3.0	3.0	2.9	2.8	2.6	2.5	2.3	2.2	2.2	2.1	2.0	2.1	2.0	2.2	2.2	2.4	2.6	2.8	3.0	3.0	3.0	2.9	2.7	2.7	2.4	2.2	2.1	2.1	2.1	2.2	2.3	2.5	2.7	2.8	2.9	3.0
2.8	2.8	2.6	2.4	2.3	2.1	1.8	1.7	1.6	1.6	1.8	2.1	3.1	3.0	2.7	3.2	3.6	3.6	3.4	3.8	3.9	4.1	3.8	3.4	3.1	2.9	2.6	2.3	2.0	1.9	2.1	2.2	2.5	2.7	2.8	2.9
3.4	3.0	2.7	2.8	3.1	3.0	2.7	2.0	1.7	1.9	2.5	2.9	3.4	3.9	5.0	4.5	4.2	4.1	4.2	4.1	3.8	3.4	3.2	3.2	3.1	3.0	3.0	3.0	3.0	2.9	2.5	2.2	2.6	2.9	3.0	3.5
2.9	3.8	3.0	3.0	4.3	5.0	4.7	3.9	3.0	2.6	2.8	3.1	3.1	3.1	3.1	3.6	3.8	3.7	3.8	2.7	3.1	3.4	3.3	3.1	3.1	3.0	3.3	3.0	2.9	2.8	2.5	2.8	2.7	2.7	2.9	2.9
3.1	3.4	3.3	3.2	3.4	3.6	3.4	3.9	4.2	4.2	3.9	3.7	3.7	4.1	3.8	3.6	3.7	3.6	4.2	4.0	3.5	3.7	3.3	3.2	3.2	3.1	3.4	3.1	2.9	3.1	2.8	3.4	3.2	3.1	3.1	3.1
3.6	3.7	3.9	3.3	3.2	3.3	3.8	3.9	4.2	4.4	4.6	3.7	4.0	4.2	3.5	3.2	3.2	3.5	3.4	3.4	4.0	4.0	3.5	3.0	3.7	5.3	3.3	2.8	3.6	3.7	4.2	4.1	4.4	4.1	3.8	3.8
3.8	3.7	3.7	3.4	3.4	3.4	3.5	3.9	3.8	3.7	3.6	3.4	3.5	3.7	3.5	3.4	3.1	3.6	3.6	3.5	3.8	4.0	3.6	4.0	4.4	3.7	5.2	5.0	4.0	4.3	4.1	3.8	3.8	3.8	3.5	3.9
3.5	3.4	3.6	3.4	3.4	3.5	3.4	3.6	3.5	3.4	3.3	3.3	3.2	3.4	3.5	3.5	3.4	3.9	3.5	3.5	3.8	3.5	3.3	3.4	3.4	3.4	3.5	3.4	3.3	3.3	3.3	3.3	3.3	3.4	3.2	3.4
3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.3	3.4	3.3	3.3	3.3	3.2	3.4	3.3	3.3	3.6	3.2	3.7	3.6	3.4	3.4	3.3	3.4	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.2	3.3	3.3	3.3
3.4	3.3	3.3	3.4	3.3	3.3	3.3	3.3	3.2	3.2	3.3	3.4	3.4	3.3	3.4	3.3	3.3	3.4	3.1	3.6	3.2	3.2	3.3	3.3	3.3	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.9	3.2	3.5	3.2
3.4	3.4	3.3	3.4	3.4	3.4	3.4	3.3	3.3	3.2	3.3	3.7	3.4	3.4	3.5	3.2	3.3	3.3	3.0	3.7	3.4	3.3	3.3	3.4	3.4	3.3	3.3	3.3	3.3	3.3	3.4	3.5	3.3	3.3	3.5	3.2
3.5	3.6	3.4	3.4	3.5	3.4	3.5	3.4	3.3	3.3	3.2	3.8	3.6	3.3	3.4	3.2	3.4	3.3	3.3	3.6	3.6	3.5	3.5	3.5	3.3	3.3	3.3	3.3	3.4	3.6	3.8	4.0	3.8	3.4	3.5	3.3
3.4	3.4	3.3	3.2	3.3	3.4	3.4	3.3	3.4	3.5	3.2	3.6	3.7	3.5	3.3	3.3	3.6	3.4	3.7	3.6	3.7	3.7	3.5	3.3	3.3	3.4	3.3	3.3	3.5	3.8	3.6	3.9	4.3	3.5	3.5	3.5
3.2	3.2	3.2	3.0	3.1	3.2	3.3	3.4	3.4	3.3	3.8	3.7	3.7	3.6	3.4	3.5	3.7	3.8	3.9	3.6	3.8	3.8	3.7	3.6	3.5	3.4	3.2	3.2	3.3	3.2	3.2	3.2	3.3	3.4	3.4	3.5
3.2	3.3	3.3	3.2	2.9	3.0	2.9	2.7	2.7	3.0	3.0	2.7	2.8	3.2	3.2	2.8	2.8	3.0	3.0	2.6	2.4	2.5	2.7	2.9	2.9	2.9	3.0	2.7	2.9	2.8	2.5	2.4	2.5	2.5	2.9	3.1
2.5	2.6	2.3	2.2	2.1	2.0	1.9	1.9	1.9	2.0	2.0	2.4	2.0	2.2	2.1	2.0	2.1	2.0	2.0	1.8	1.8	1.9	2.3	2.6	2.4	2.2	2.6	2.8	2.8	2.6	2.6	2.7	2.4	2.2	2.3	2.6
1.7	1.7	1.7	1.7	1.9	2.0	1.9	1.8	1.9	1.8	1.6	1.6	1.7	1.6	1.5	1.7	2.0	2.1	2.1	2.2	2.5	2.1	1.7	1.4	2.0	2.1	1.6	1.3	1.4	1.2	1.1	1.1	1.4	1.6	1.9	1.6
2.2	2.1	2.0	1.9	1.8	1.7	1.5	1.2	1.0	1.1	1.4	1.6	1.6	1.5	1.5	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.2	1.2	1.1	1.1	1.1	1.1	1.0	.9	.8	.8	1.0	1.4	2.1	2.3

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



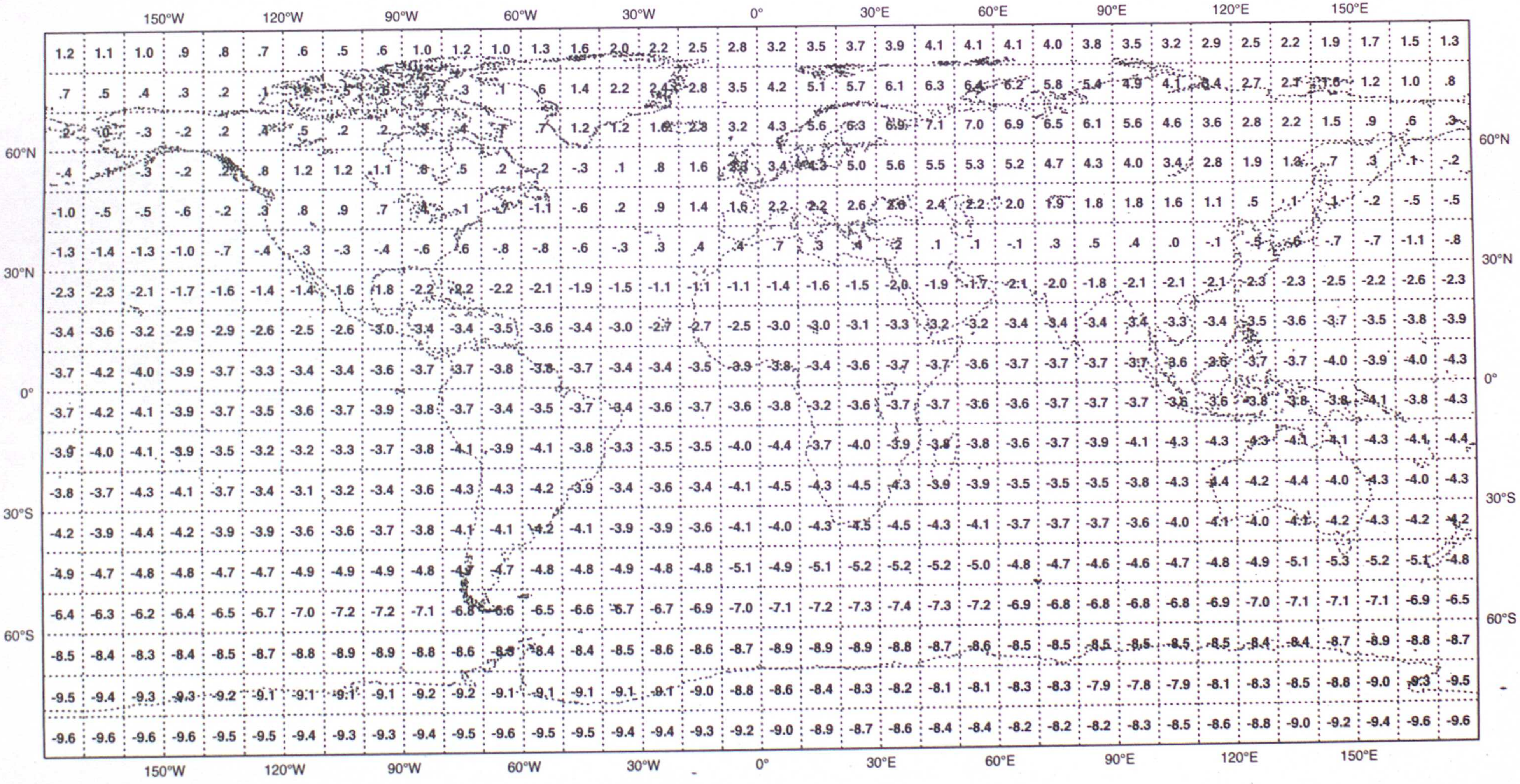
8.1	8.0	8.0	8.2	8.5	8.8	9.2	9.6	10.0	11.1	12.1	11.5	12.8	13.4	13.7	11.7	10.6	10.1	9.3	9.2	9.5	9.8	9.7	9.5	10.5	10.8	10.7	10.7	10.9	10.7	10.3	9.9	9.4	8.9	8.6	8.3
6.2	6.3	6.5	7.0	7.6	8.1	8.6	9.1	9.1	10.4	9.3	10.0	12.4	16.8	17.0	11.7	7.2	5.2	4.3	5.1	5.7	6.3	6.8	7.6	8.6	9.5	10.4	11.2	12.0	12.0	11.5	10.1	8.6	7.8	6.8	6.2
4.6	4.8	6.0	7.8	8.4	9.0	9.8	11.2	11.8	10.8	9.0	5.6	3.7	7.2	4.6	3.8	2.9	2.5	3.0	3.8	4.4	4.9	5.4	5.5	5.9	6.6	7.8	9.7	11.2	12.7	13.0	12.5	10.7	8.3	6.5	5.2
1.7	1.9	.3	.4	2.2	5.2	6.3	7.7	9.4	10.4	9.2	7.1	4.0	2.3	.7	.1	.1	.8	2.4	2.5	3.7	4.9	3.3	3.0	3.2	4.1	5.0	7.3	8.2	10.7	10.9	10.8	6.4	4.7	3.9	2.5
.7	.4	-.2	-.2	.3	1.0	2.3	2.2	3.5	4.7	6.0	3.6	1.9	.8	-.3	-.6	-1.1	-.7	.5	1.1	2.7	2.8	1.0	-.3	.4	2.9	4.3	6.4	6.2	6.9	6.5	5.4	3.9	2.6	1.5	1.6
-1.4	-1.2	-.9	-1.4	-1.9	-2.6	-3.0	-2.2	-2.1	-1.8	-1.8	-1.8	-1.7	-2.1	-2.1	-3.2	-3.8	-4.2	-3.9	-3.3	-1.2	-.7	-1.4	-1.8	-1.3	2.8	5.0	5.4	2.0	.9	-.2	-.7	-1.1	-.6	-1.2	-.8
-6.3	-6.5	-5.6	-5.3	-6.4	-7.1	-7.3	-4.1	-4.1	-6.1	-7.7	-8.2	-8.8	-8.5	-7.7	-8.2	-8.4	-7.7	-6.9	-6.7	-6.6	-8.1	-5.6	-5.9	-7.7	-7.7	-5.9	-6.2	-5.7	-4.4	-4.5	-4.7	-5.2	-5.8	-6.9	-6.4
-11.8	-11.7	-9.9	-9.7	-11.0	-10.3	-6.3	-5.8	-9.6	-12.6	-13.0	-12.7	-13.7	-14.4	-14.0	-11.2	-8.2	-5.6	-6.7	-8.3	-8.8	-8.8	-8.6	-10.4	-12.6	-12.4	-11.8	-10.9	-8.0	-7.5	-7.8	-8.3	-10.8	-12.5	-12.7	-12.7
-11.2	-10.3	-9.3	-9.9	-10.1	-8.9	-8.6	-9.7	-10.4	-10.3	-8.5	-9.2	-8.8	-7.4	-6.5	-4.7	-4.2	-5.0	-7.1	-7.3	-7.5	-7.7	-9.5	-9.4	-8.3	-7.7	-6.4	-5.3	-5.2	-5.1	-4.6	-4.5	-6.7	-7.3	-8.4	-10.3
-6.2	-6.4	-6.8	-7.9	-9.1	-9.9	-11.8	-12.6	-13.5	-11.6	-4.5	-2.6	-2.4	-4.1	-4.5	-7.3	-7.6	-6.9	-4.2	-2.3	-3.2	-5.7	-6.3	-4.6	-4.4	-4.5	-5.3	-4.3	-3.8	-2.8	-3.3	-2.9	-3.1	-4.0	-4.4	-5.9
-7.7	-7.2	-7.7	-7.0	-6.7	-8.0	-11.4	-12.5	-14.1	-13.7	-8.2	-5.6	-5.9	-5.7	-6.0	-10.2	-11.9	-11.7	-9.8	-5.7	-6.5	-6.7	-4.8	-4.8	-5.8	-7.1	-10.2	-10.8	-10.0	-9.4	-8.5	-6.5	-5.7	-7.9	-8.7	-9.3
-8.8	-8.8	-7.9	-6.8	-5.8	-4.7	-7.0	-9.0	-10.2	-11.9	-13.6	-7.6	-8.2	-5.8	-4.5	-7.1	-9.8	-12.5	-13.8	-11.7	-8.8	-9.4	-6.3	-6.2	-5.6	-5.6	-6.2	-10.0	-12.1	-11.3	-9.9	-10.0	-7.5	-6.8	-8.0	-8.8
-7.0	-5.6	-4.6	-4.5	-5.4	-4.4	-3.6	-3.8	-5.4	-7.2	-9.6	-6.6	-7.2	-5.5	-4.3	-4.5	-5.8	-8.0	-8.2	-9.8	-8.9	-7.4	-6.2	-5.5	-5.0	-5.7	-5.7	-5.9	-8.0	-9.0	-7.9	-8.3	-8.3	-7.2	-4.8	-5.2
-4.2	-3.2	-2.9	-2.3	-2.5	-2.5	-2.0	-2.0	-1.7	-2.2	-2.7	-3.5	-3.6	-3.3	-3.2	-2.8	-2.7	-2.9	-1.9	-2.0	-2.4	-3.0	-2.7	-2.1	-2.4	-2.8	-2.5	-2.6	-2.9	-2.7	-2.3	-2.1	-2.1	-2.9	-3.4	-3.0
-1.2	-.9	-.4	-.7	-.2	.7	.7	.8	.7	.5	.9	.7	.4	.3	.1	.3	.2	.5	1.1	1.1	1.1	1.1	1.2	.8	.8	.5	.3	.3	.4	.5	.4	.6	.5	-.1	-.4	-.8
1.4	1.3	1.3	1.6	1.5	1.8	2.2	2.4	2.1	1.6	1.6	1.6	1.6	1.6	1.8	2.3	2.1	2.4	2.6	2.6	3.0	3.3	3.5	3.8	3.1	2.3	2.9	3.1	2.9	2.4	2.9	3.4	2.7	1.9	1.6	1.6
2.3	2.5	2.8	2.9	3.6	4.2	3.8	3.6	4.3	3.8	2.9	4.0	3.3	2.9	2.6	3.5	4.8	7.0	8.7	9.8	10.1	10.7	11.3	10.4	7.4	8.2	11.6	13.2	12.6	11.8	11.9	11.1	9.4	7.6	3.8	2.3
5.1	4.6	4.2	4.6	5.1	5.6	6.5	8.0	8.5	6.6	5.1	4.9	5.2	5.5	5.8	6.7	7.8	8.7	9.5	10.1	10.6	11.5	12.2	12.6	12.9	13.3	13.3	13.0	12.5	12.0	11.3	10.5	9.5	7.9	5.7	5.4

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



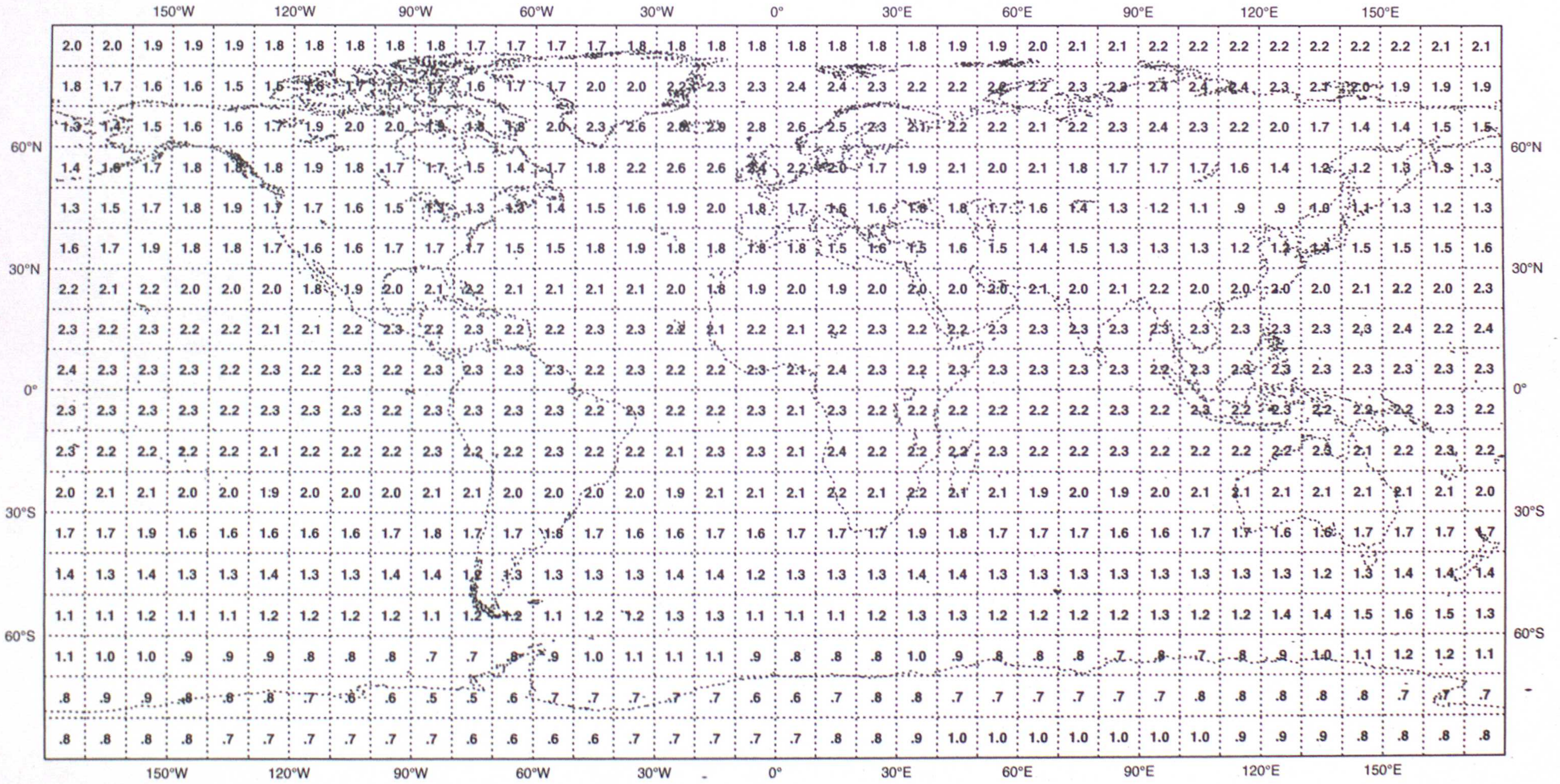
2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.8	2.9	3.3	3.0	3.5	4.2	4.6	3.9	3.3	3.4	3.5	3.2	2.9	2.7	2.7	2.9	2.7	2.5	2.4	2.2	2.1	2.1	2.2	2.4	2.7	2.7	2.6	2.6
2.3	2.3	2.3	2.6	2.7	2.5	2.8	2.8	2.7	2.8	3.1	4.4	6.1	5.6	5.3	4.5	3.2	3.0	2.5	2.6	2.9	3.1	2.9	2.7	3.0	3.2	3.2	3.0	2.9	2.4	2.1	2.1	2.3	2.5	2.6	2.4
3.0	3.0	3.4	3.9	4.0	3.5	2.9	2.2	2.2	2.7	3.3	3.2	3.4	4.8	5.8	3.8	2.9	2.8	2.7	2.8	3.0	2.7	2.5	2.4	2.5	2.8	3.1	3.4	3.8	3.8	3.0	2.7	3.6	3.3	3.1	3.3
3.0	3.5	3.7	3.9	4.1	4.5	4.4	4.1	3.1	3.1	3.7	3.5	2.8	3.1	3.4	3.3	3.3	3.4	3.1	2.0	2.6	2.5	3.3	2.9	2.9	3.2	3.7	3.2	3.0	3.3	2.7	2.9	2.5	2.5	2.7	3.0
3.3	3.5	3.8	3.5	3.4	3.5	3.1	3.5	3.7	3.7	3.9	3.6	2.9	3.2	4.0	4.1	4.1	3.8	3.7	3.3	3.0	2.9	3.7	3.6	3.4	3.0	3.2	3.3	3.1	3.4	3.1	3.5	3.0	2.8	3.1	3.4
3.9	3.6	3.5	3.8	4.0	4.3	4.5	4.4	3.8	4.2	4.6	4.2	3.8	4.3	4.6	4.6	4.4	4.2	3.9	4.1	3.9	4.0	4.3	3.9	4.5	5.2	3.4	2.7	3.2	3.4	3.8	3.8	4.0	3.5	3.6	3.7
5.5	5.1	5.4	5.0	4.7	4.8	4.9	5.0	4.5	4.7	4.6	4.2	4.5	4.7	4.6	4.2	4.9	5.4	4.7	4.2	4.4	4.9	4.3	4.8	5.0	4.2	5.2	5.4	4.3	4.5	4.5	4.1	4.5	4.9	5.0	5.3
3.7	4.0	5.1	5.6	5.2	4.9	5.6	5.5	4.4	3.7	3.6	3.5	3.2	3.6	4.2	5.7	6.3	5.2	4.8	4.6	3.5	3.0	3.6	3.5	3.0	3.0	3.7	4.1	4.2	3.5	3.3	4.1	5.3	4.5	3.8	4.3
5.1	4.1	3.7	3.9	3.9	3.9	4.0	4.0	3.4	3.7	3.9	4.9	5.0	5.3	5.8	4.7	3.0	3.5	3.9	3.8	3.4	3.2	3.2	3.8	4.8	4.3	4.3	3.8	3.2	2.6	2.7	3.3	4.6	4.9	5.4	5.7
3.3	3.5	3.3	3.8	3.5	3.4	3.4	3.2	3.4	4.0	3.9	2.3	2.4	3.0	3.6	3.9	3.7	3.7	2.9	2.8	2.5	3.3	3.4	3.1	3.2	3.1	3.5	3.1	2.8	2.2	2.4	2.0	2.0	2.6	2.9	3.3
4.6	4.3	3.7	4.1	4.7	5.6	4.6	4.4	3.9	4.6	3.8	4.4	4.0	3.8	4.4	4.0	3.3	3.6	4.6	4.3	4.3	4.5	3.3	3.5	3.9	3.8	3.8	3.9	4.0	3.8	4.7	4.7	3.7	4.3	4.7	5.0
4.2	5.0	4.6	4.9	5.2	5.3	6.1	4.5	3.7	4.1	4.8	4.2	4.2	4.9	4.9	3.9	3.7	3.1	3.0	4.7	4.9	5.4	4.1	4.2	4.4	4.3	3.9	4.1	4.0	3.8	5.3	5.6	4.7	3.9	4.7	4.4
4.5	4.6	4.5	3.9	4.1	4.6	4.6	4.0	4.2	4.2	4.9	4.1	4.5	4.8	4.9	5.0	4.8	4.6	4.6	4.7	4.7	5.6	5.0	3.9	3.9	4.5	4.9	4.0	3.9	4.1	4.2	4.6	4.9	4.8	4.6	4.5
3.9	4.2	4.2	3.8	3.5	3.9	3.9	3.7	3.6	3.8	4.1	4.0	4.0	4.0	4.1	4.4	4.0	4.3	4.1	3.8	3.8	4.3	4.2	4.0	4.2	4.2	4.1	3.9	3.8	3.7	3.4	3.4	3.4	3.8	4.0	3.7
3.5	3.2	3.5	3.4	2.9	2.8	2.8	2.7	2.7	2.9	2.9	3.0	3.0	3.0	3.1	3.1	3.0	3.2	2.8	2.6	2.8	2.7	2.9	3.1	3.0	3.1	3.2	3.0	2.9	2.9	2.6	2.7	2.9	2.9	3.0	3.4
2.6	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.3	2.4	2.4	2.6	2.7	2.7	2.7	2.5	2.6	2.4	2.4	2.3	2.2	2.3	2.5	2.8	2.6	2.5	2.9	3.4	3.6	3.2	3.2	3.1	2.6	2.5	2.5	2.5
2.2	2.1	2.0	2.1	2.7	3.0	2.6	2.6	2.6	2.5	2.1	2.1	2.0	2.1	2.2	2.2	2.7	3.3	3.5	3.8	4.1	3.6	2.9	2.3	3.2	3.3	2.8	2.6	2.7	2.5	2.2	2.0	2.1	2.2	2.7	2.3
3.9	3.7	3.6	3.4	3.1	3.1	2.8	2.2	1.9	2.3	2.8	3.0	2.8	2.9	2.8	2.5	2.4	2.4	2.3	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.7	1.6	1.5	1.6	1.9	2.7	3.7	4.0

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



1.2	1.1	1.0	.9	.8	.7	.6	.5	.6	1.0	1.2	1.0	1.3	1.6	2.0	2.2	2.5	2.8	3.2	3.5	3.7	3.9	4.1	4.1	4.1	4.0	3.8	3.5	3.2	2.9	2.5	2.2	1.9	1.7	1.5	1.3
.7	.5	.4	.3	.2	.1	.2	.5	.6	.2	-.3	.1	.6	1.4	2.2	2.4	2.8	3.5	4.2	5.1	5.7	6.1	6.3	6.4	6.2	5.8	5.4	4.9	4.1	3.4	2.7	2.1	1.6	1.2	1.0	.8
.2	.0	-.3	-.2	.2	.4	.5	.2	.2	.3	.4	.7	.7	1.2	1.2	1.6	2.8	3.2	4.3	5.6	6.3	6.9	7.1	7.0	6.9	6.5	6.1	5.6	4.6	3.6	2.8	2.2	1.5	.9	.6	.3
-.4	-.1	-.3	-.2	.2	.8	1.2	1.2	1.1	.8	.5	.2	-.2	-.3	.1	.8	1.6	2.3	3.4	4.3	5.0	5.6	5.5	5.3	5.2	4.7	4.3	4.0	3.4	2.8	1.9	1.3	.7	.3	.1	-.2
-1.0	-.5	-.5	-.6	-.2	.3	.8	.9	.7	.4	.1	-.7	-1.1	-.6	.2	.9	1.4	1.6	2.2	2.2	2.6	2.0	2.4	2.2	2.0	1.9	1.8	1.8	1.6	1.1	.5	.1	.1	-.2	-.5	-.5
-1.3	-1.4	-1.3	-1.0	-.7	-.4	-.3	-.3	-.4	-.6	.6	-.8	-.8	-.6	-.3	.3	.4	.4	.7	.3	.4	.2	.1	.1	-.1	.3	.5	.4	.0	-.1	-.5	-.6	-.7	-.7	-1.1	-.8
-2.3	-2.3	-2.1	-1.7	-1.6	-1.4	-1.4	-1.6	-1.8	-2.2	-2.2	-2.2	-2.1	-1.9	-1.5	-1.1	-1.1	-1.1	-1.4	-1.6	-1.5	-2.0	-1.9	-1.7	-2.1	-2.0	-1.8	-2.1	-2.1	-2.1	-2.3	-2.3	-2.5	-2.2	-2.6	-2.3
-3.4	-3.6	-3.2	-2.9	-2.9	-2.6	-2.5	-2.6	-3.0	-3.4	-3.4	-3.5	-3.6	-3.4	-3.0	-2.7	-2.7	-2.5	-3.0	-3.0	-3.1	-3.3	-3.2	-3.2	-3.4	-3.4	-3.4	-3.4	-3.3	-3.4	-3.5	-3.6	-3.7	-3.5	-3.8	-3.9
-3.7	-4.2	-4.0	-3.9	-3.7	-3.3	-3.4	-3.4	-3.6	-3.7	-3.7	-3.8	-3.8	-3.7	-3.4	-3.4	-3.5	-3.9	-3.8	-3.4	-3.6	-3.7	-3.7	-3.6	-3.7	-3.7	-3.7	-3.7	-3.6	-3.6	-3.7	-3.7	-4.0	-3.9	-4.0	-4.3
-3.7	-4.2	-4.1	-3.9	-3.7	-3.5	-3.6	-3.7	-3.9	-3.8	-3.7	-3.4	-3.5	-3.7	-3.4	-3.6	-3.7	-3.6	-3.8	-3.2	-3.6	-3.7	-3.7	-3.6	-3.6	-3.7	-3.7	-3.7	-3.6	-3.6	-3.8	-3.8	-3.8	-4.1	-3.8	-4.3
-3.9	-4.0	-4.1	-3.9	-3.5	-3.2	-3.2	-3.3	-3.7	-3.8	-4.1	-3.9	-4.1	-3.8	-3.3	-3.5	-3.5	-4.0	-4.4	-3.7	-4.0	-3.9	-3.8	-3.8	-3.6	-3.7	-3.9	-4.1	-4.3	-4.3	-4.3	-4.1	-4.1	-4.3	-4.1	-4.4
-3.8	-3.7	-4.3	-4.1	-3.7	-3.4	-3.1	-3.2	-3.4	-3.6	-4.3	-4.3	-4.2	-3.9	-3.4	-3.6	-3.4	-4.1	-4.5	-4.3	-4.5	-4.3	-3.9	-3.9	-3.5	-3.5	-3.5	-3.8	-4.3	-4.4	-4.2	-4.4	-4.0	-4.3	-4.0	-4.3
-4.2	-3.9	-4.4	-4.2	-3.9	-3.9	-3.6	-3.6	-3.7	-3.8	-4.1	-4.1	-4.2	-4.1	-3.9	-3.9	-3.6	-4.1	-4.0	-4.3	-4.5	-4.5	-4.3	-4.1	-3.7	-3.7	-3.7	-3.6	-4.0	-4.1	-4.0	-4.1	-4.2	-4.3	-4.2	-4.2
-4.9	-4.7	-4.8	-4.8	-4.7	-4.7	-4.9	-4.9	-4.9	-4.8	-4.7	-4.7	-4.8	-4.8	-4.9	-4.8	-4.8	-5.1	-4.9	-5.1	-5.2	-5.2	-5.2	-5.0	-4.8	-4.7	-4.6	-4.6	-4.7	-4.8	-4.9	-5.1	-5.3	-5.2	-5.1	-4.8
-6.4	-6.3	-6.2	-6.4	-6.5	-6.7	-7.0	-7.2	-7.2	-7.1	-6.8	-6.6	-6.5	-6.6	-6.7	-6.7	-6.9	-7.0	-7.1	-7.2	-7.3	-7.4	-7.3	-7.2	-6.9	-6.8	-6.8	-6.8	-6.8	-6.9	-7.0	-7.1	-7.1	-7.1	-6.9	-6.5
-8.5	-8.4	-8.3	-8.4	-8.5	-8.7	-8.8	-8.9	-8.9	-8.8	-8.6	-8.5	-8.4	-8.4	-8.5	-8.6	-8.6	-8.7	-8.9	-8.9	-8.9	-8.8	-8.7	-8.6	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5	-8.4	-8.4	-8.7	-8.9	-8.8	-8.7
-9.5	-9.4	-9.3	-9.3	-9.2	-9.1	-9.1	-9.1	-9.1	-9.2	-9.2	-9.1	-9.1	-9.1	-9.1	-9.1	-9.0	-8.8	-8.6	-8.4	-8.3	-8.2	-8.1	-8.1	-8.3	-8.3	-7.9	-7.8	-7.9	-8.1	-8.3	-8.5	-8.8	-9.0	-9.3	-9.5
-9.6	-9.6	-9.6	-9.6	-9.5	-9.5	-9.4	-9.3	-9.3	-9.4	-9.5	-9.6	-9.5	-9.5	-9.5	-9.4	-9.4	-9.3	-9.2	-9.0	-8.9	-8.7	-8.6	-8.4	-8.4	-8.2	-8.2	-8.2	-8.3	-8.5	-8.6	-8.8	-9.0	-9.2	-9.4	-9.6	-9.6

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1
1.8	1.7	1.6	1.6	1.5	1.5	1.6	1.7	1.7	1.7	1.6	1.7	1.7	2.0	2.0	2.2	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.1	2.0	1.9	1.9	1.9
1.3	1.4	1.5	1.6	1.6	1.7	1.9	2.0	2.0	1.9	1.8	1.8	2.0	2.3	2.6	2.8	2.9	2.8	2.6	2.5	2.3	2.1	2.2	2.2	2.1	2.2	2.3	2.4	2.3	2.2	2.0	1.7	1.4	1.4	1.5	1.5
1.4	1.6	1.7	1.8	1.8	1.8	1.9	1.8	1.7	1.7	1.5	1.4	1.7	1.8	2.2	2.6	2.6	2.4	2.2	2.0	1.7	1.9	2.1	2.0	2.1	1.8	1.7	1.7	1.7	1.6	1.4	1.2	1.2	1.3	1.3	1.3
1.3	1.5	1.7	1.8	1.9	1.7	1.7	1.6	1.5	1.3	1.3	1.3	1.4	1.5	1.6	1.9	2.0	1.8	1.7	1.6	1.6	1.6	1.8	1.7	1.6	1.4	1.3	1.2	1.1	.9	.9	1.0	1.1	1.3	1.2	1.3
1.6	1.7	1.9	1.8	1.8	1.7	1.6	1.6	1.7	1.7	1.7	1.5	1.5	1.8	1.9	1.8	1.8	1.8	1.8	1.5	1.6	1.5	1.6	1.5	1.4	1.5	1.3	1.3	1.3	1.2	1.2	1.4	1.5	1.5	1.5	1.6
2.2	2.1	2.2	2.0	2.0	2.0	1.8	1.9	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.0	1.8	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.3
2.3	2.2	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.3	2.2	2.1	2.2	2.1	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.2	2.4
2.4	2.3	2.3	2.3	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.3	2.1	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3
2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.3	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.3	2.2
2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.1	2.3	2.3	2.1	2.4	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.1	2.2	2.3	2.2
2.0	2.1	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	1.9	2.0	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0
1.7	1.7	1.9	1.6	1.6	1.6	1.6	1.6	1.7	1.8	1.7	1.7	1.8	1.7	1.6	1.6	1.7	1.6	1.7	1.7	1.7	1.9	1.8	1.7	1.7	1.7	1.6	1.6	1.7	1.7	1.6	1.6	1.7	1.7	1.7	1.7
1.4	1.3	1.4	1.3	1.3	1.4	1.3	1.3	1.4	1.4	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.2	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.4	1.4	1.4
1.1	1.1	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.1	1.2	1.2	1.3	1.3	1.1	1.1	1.1	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.4	1.4	1.5	1.6	1.5	1.3
1.1	1.0	1.0	.9	.9	.9	.8	.8	.8	.7	.7	.8	.9	1.0	1.1	1.1	1.1	.9	.8	.8	.8	1.0	.9	.8	.8	.8	.7	.8	.7	.8	.9	1.0	1.1	1.2	1.2	1.1
.8	.9	.9	.8	.8	.8	.7	.6	.6	.5	.5	.6	.7	.7	.7	.7	.7	.6	.6	.7	.8	.8	.7	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.7	.7	.7
.8	.8	.8	.8	.7	.7	.7	.7	.7	.7	.6	.6	.6	.6	.7	.7	.7	.7	.7	.8	.8	.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.9	.9	.9	.8	.8	.8

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

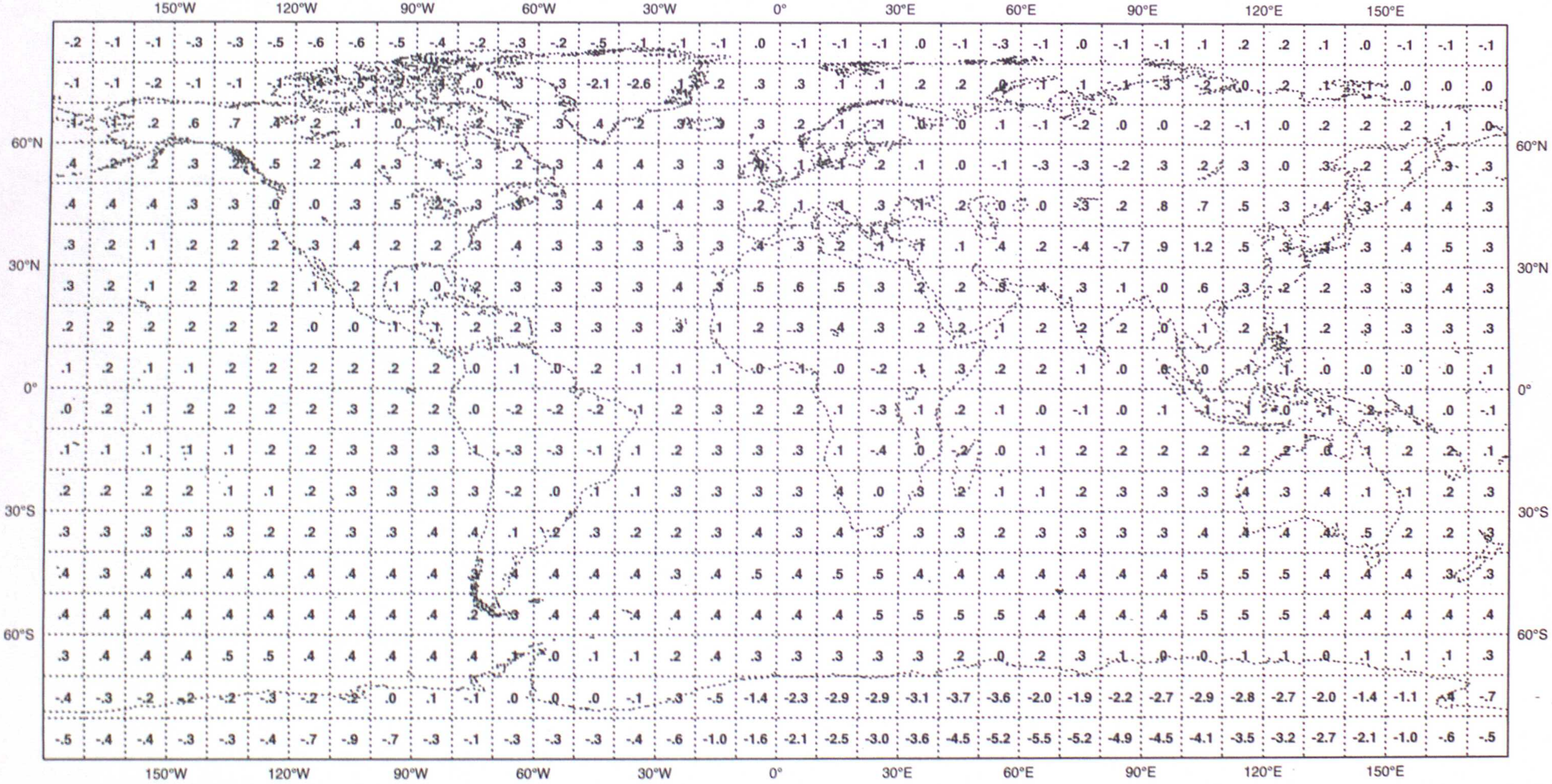
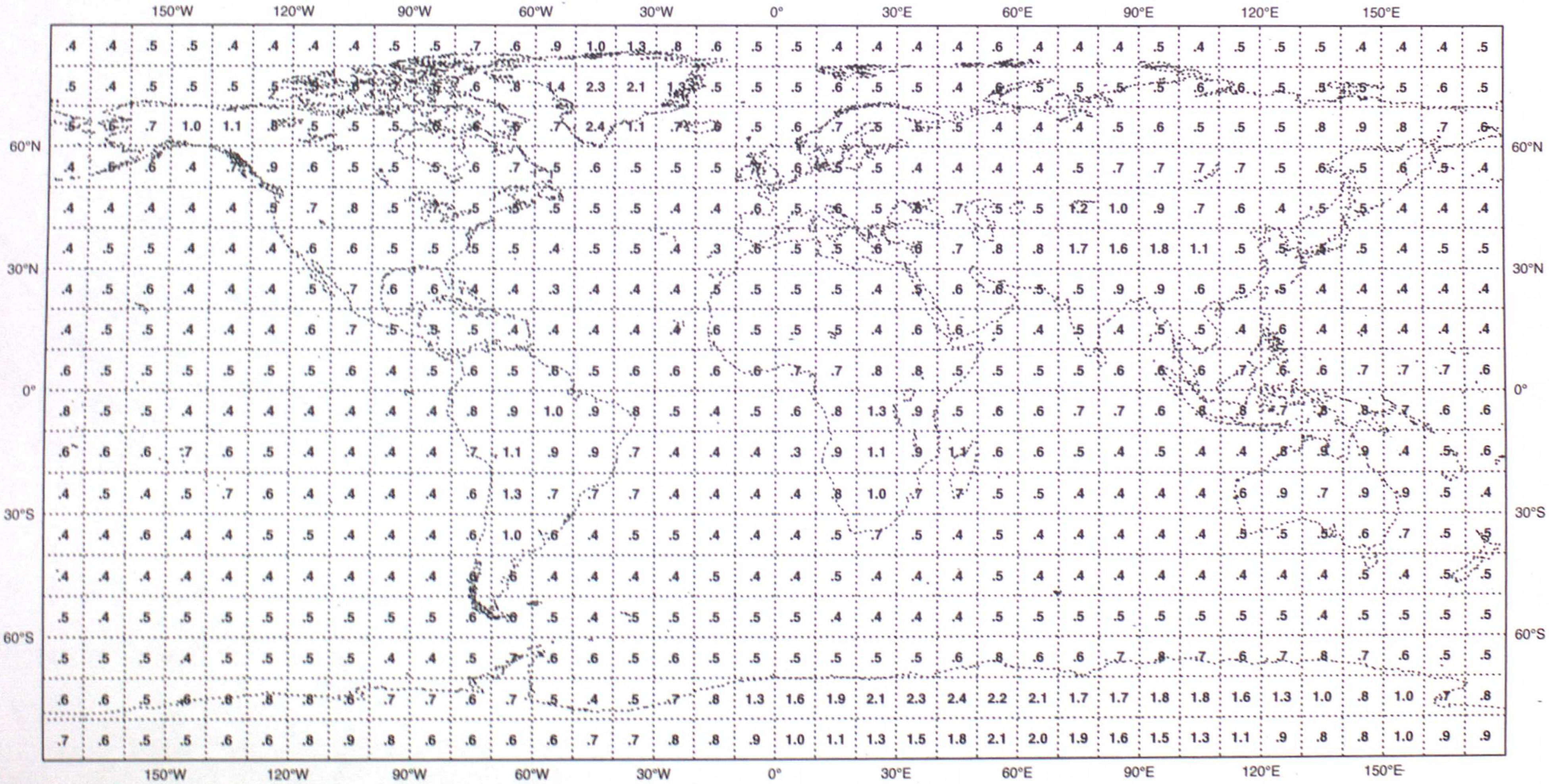

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-.2 -.1 -.1 -.3 -.3 -.5 -.6 -.6 -.5 -.4 -.2 -.3 -.2 -.5 -.1 -.1 -.1 .0 -.1 -.1 -.1 .0 -.1 -.3 -.1 .0 -.1 -.1 .1 .2 .2 .1 .0 -.1 -.1 -.1
-.1 -.1 -.2 -.1 -.1 -.1 .4 .5 .2 .4 .0 .3 .3 -2.1 -2.6 .1 .2 .3 .3 .1 .1 .2 .2 .0 .1 .1 -.1 -.3 -.2 .0 .2 .1 .1 .0 .0 .0
.1 .1 .2 .6 .7 .4 .2 .1 .0 .1 .2 .2 .3 .4 .2 .3 .3 .3 .2 .1 .1 .0 .0 .1 -.1 -.2 .0 .0 -.2 -.1 .0 .2 .2 .2 .1 .0
.4 .2 .2 .3 .2 .5 .2 .4 .3 .4 .3 .2 .3 .4 .4 .3 .3 .0 .1 .1 .2 .1 .0 -.1 -.3 -.3 -.2 .3 .2 .3 .0 .3 .2 .2 .3 .3
.4 .4 .4 .3 .3 .0 .0 .3 .5 .2 .3 .3 .3 .4 .4 .4 .3 .2 .1 .1 .3 .1 .2 .0 .0 -.3 .2 .8 .7 .5 .3 .4 .3 .4 .4 .3
.3 .2 .1 .2 .2 .2 .3 .4 .2 .2 .3 .4 .3 .3 .3 .3 .3 .4 .3 .2 .1 .1 .1 .4 .2 -.4 -.7 .9 1.2 .5 .3 .3 .3 .4 .5 .3
.3 .2 .1 .2 .2 .2 .1 .2 .1 .0 .2 .3 .3 .3 .3 .4 .3 .5 .6 .5 .3 .2 .2 .3 .4 .3 .1 .0 .6 .3 .2 .2 .3 .3 .4 .3
.2 .2 .2 .2 .2 .2 .0 .0 .1 .1 .2 .2 .3 .3 .3 .3 .1 .2 -.3 .4 .3 .2 .2 .1 .2 .2 .2 .0 .1 .2 .1 .2 .3 .3 .3 .3
.1 .2 .1 .1 .2 .2 .2 .2 .2 .2 .0 .1 .0 .2 .1 .1 .1 .0 -.1 .0 -.2 .1 .3 .2 .2 .1 .0 .0 .0 -.1 .1 .0 .0 .0 .0 .1
.0 .2 .1 .2 .2 .2 .2 .3 .2 .2 .0 -.2 -.2 -.2 -.1 .2 .3 .2 .2 .1 -.3 .1 .2 .1 .0 -.1 .0 .1 -.1 -.1 .0 -.1 -.2 -.1 .0 -.1
.1 .1 .1 .1 .1 .2 .2 .3 .3 .3 .1 -.3 -.3 -.1 .1 .2 .3 .3 .3 .1 -.4 .0 -.2 .0 .1 .2 .2 .2 .2 .2 .2 .0 .1 .2 .2 .1
.2 .2 .2 .2 .1 .1 .2 .3 .3 .3 .3 -.2 .0 .1 .1 .3 .3 .3 .3 .4 .0 .3 .2 .1 .1 .2 .3 .3 .3 .4 .3 .4 .1 .1 .2 .3
.3 .3 .3 .3 .3 .2 .2 .3 .3 .4 .4 .1 .2 .3 .2 .2 .3 .4 .3 .4 .3 .3 .3 .2 .3 .3 .3 .3 .4 .4 .4 .4 .5 .2 .2 .3
.4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .5 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .2 .3 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4
.3 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .1 .0 .1 .1 .2 .4 .3 .3 .3 .3 .3 .2 .0 .2 .3 .1 .0 .0 .1 .1 .0 .1 .1 .1 .3
-.4 -.3 -.2 -.2 -.2 -.3 -.2 -.2 .0 .1 -.1 .0 .0 .0 -.1 -.3 -.5 -1.4 -2.3 -2.9 -2.9 -3.1 -3.7 -3.6 -2.0 -1.9 -2.2 -2.7 -2.9 -2.8 -2.7 -2.0 -1.4 -1.1 -.4 -.7
-.5 -.4 -.4 -.3 -.3 -.4 -.7 -.9 -.7 -.3 -.1 -.3 -.3 -.3 -.4 -.6 -1.0 -1.6 -2.1 -2.5 -3.0 -3.6 -4.5 -5.2 -5.5 -5.2 -4.9 -4.5 -4.1 -3.5 -3.2 -2.7 -2.1 -1.0 -.6 -.5

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.4	.4	.5	.5	.4	.4	.4	.4	.5	.5	.7	.6	.9	1.0	1.3	.8	.6	.5	.5	.4	.4	.4	.4	.6	.4	.4	.4	.5	.4	.5	.5	.5	.4	.4	.4	.5
.5	.4	.5	.5	.5	.5	.9	.8	.7	.5	.6	.8	1.4	2.3	2.1	1.3	.5	.5	.5	.6	.5	.5	.4	.6	.5	.5	.5	.5	.6	.6	.5	.5	.5	.5	.6	.5
.5	.6	.7	1.0	1.1	.8	.5	.5	.5	.6	.6	.6	.7	2.4	1.1	.7	.6	.5	.6	.7	.5	.5	.5	.4	.4	.4	.5	.6	.5	.5	.5	.8	.9	.8	.7	.6
.4	.6	.6	.4	.7	.9	.6	.5	.5	.5	.6	.7	.5	.6	.5	.5	.5	.7	.6	.5	.5	.4	.4	.4	.4	.5	.7	.7	.7	.7	.5	.6	.5	.6	.5	.4
.4	.4	.4	.4	.4	.5	.7	.8	.5	.7	.5	.5	.5	.5	.5	.4	.4	.6	.5	.6	.5	.8	.7	.5	.5	1.2	1.0	.9	.7	.6	.4	.5	.5	.4	.4	.4
.4	.5	.5	.4	.4	.4	.6	.6	.5	.5	.5	.5	.4	.5	.5	.4	.3	.6	.5	.5	.6	.6	.7	.8	.8	1.7	1.6	1.8	1.1	.5	.5	.5	.5	.4	.5	.5
.4	.5	.6	.4	.4	.4	.5	.7	.6	.6	.4	.4	.3	.4	.4	.4	.5	.5	.5	.5	.4	.5	.6	.6	.5	.5	.9	.9	.6	.5	.5	.4	.4	.4	.4	.4
.4	.5	.5	.4	.4	.4	.6	.7	.5	.8	.5	.4	.4	.4	.4	.4	.6	.5	.5	.5	.4	.6	.6	.5	.4	.5	.4	.5	.5	.4	.6	.4	.4	.4	.4	.4
.6	.5	.5	.5	.5	.5	.5	.6	.4	.5	.6	.5	.8	.5	.6	.6	.6	.6	.7	.7	.8	.8	.5	.5	.5	.5	.6	.6	.6	.7	.6	.6	.7	.7	.7	.6
.8	.5	.5	.4	.4	.4	.4	.4	.4	.4	.8	.9	1.0	.9	.8	.5	.4	.5	.6	.8	1.3	.9	.5	.6	.6	.7	.7	.6	.8	.8	.7	.8	.8	.7	.6	.6
.6	.6	.6	.7	.6	.5	.4	.4	.4	.4	.7	1.1	.9	.9	.7	.4	.4	.4	.3	.9	1.1	.9	1.1	.6	.6	.5	.4	.5	.4	.4	.8	.9	.9	.4	.5	.6
.4	.5	.4	.5	.7	.6	.4	.4	.4	.4	.6	1.3	.7	.7	.7	.4	.4	.4	.4	.8	1.0	.7	.7	.5	.5	.4	.4	.4	.4	.6	.9	.7	.9	.9	.5	.4
.4	.4	.6	.4	.4	.5	.5	.4	.4	.4	.6	1.0	.6	.4	.5	.5	.4	.4	.4	.5	.7	.5	.4	.5	.4	.4	.4	.4	.4	.5	.5	.5	.6	.7	.5	.5
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.6	.6	.4	.4	.4	.4	.5	.4	.4	.5	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.5
.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5
.5	.5	.5	.4	.5	.5	.5	.5	.4	.4	.5	.7	.6	.6	.5	.6	.5	.5	.5	.5	.5	.5	.6	.8	.6	.6	.7	.8	.7	.6	.7	.8	.7	.6	.5	.5
.6	.6	.5	.6	.8	.8	.8	.6	.7	.7	.6	.7	.5	.4	.5	.7	.8	1.3	1.6	1.9	2.1	2.3	2.4	2.2	2.1	1.7	1.7	1.8	1.8	1.6	1.3	1.0	.8	1.0	.7	.8
.7	.6	.5	.5	.6	.6	.8	.9	.8	.6	.6	.6	.6	.7	.7	.8	.8	.9	1.0	1.1	1.3	1.5	1.8	2.1	2.0	1.9	1.6	1.5	1.3	1.1	.9	.8	.8	1.0	.9	.9

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

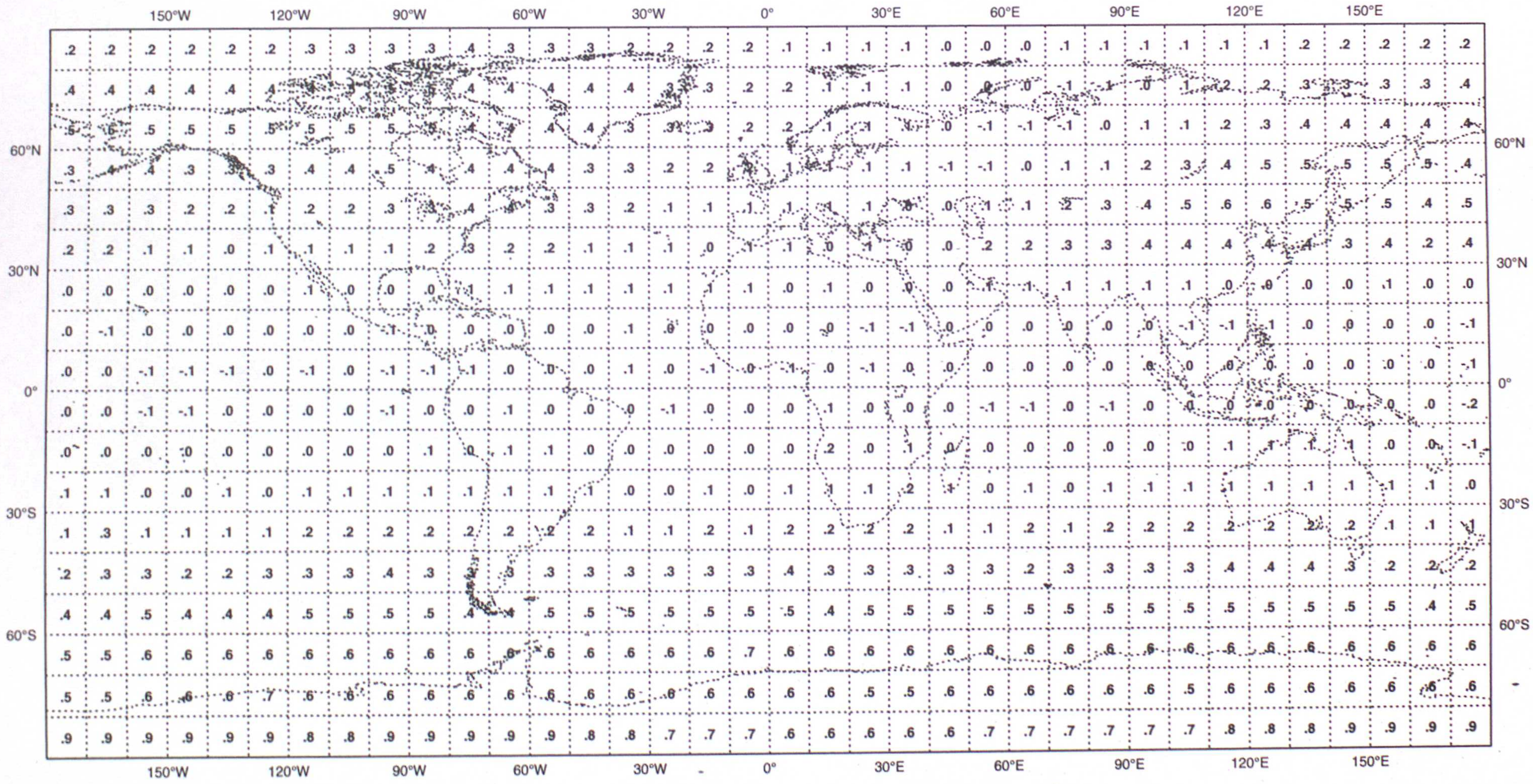

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

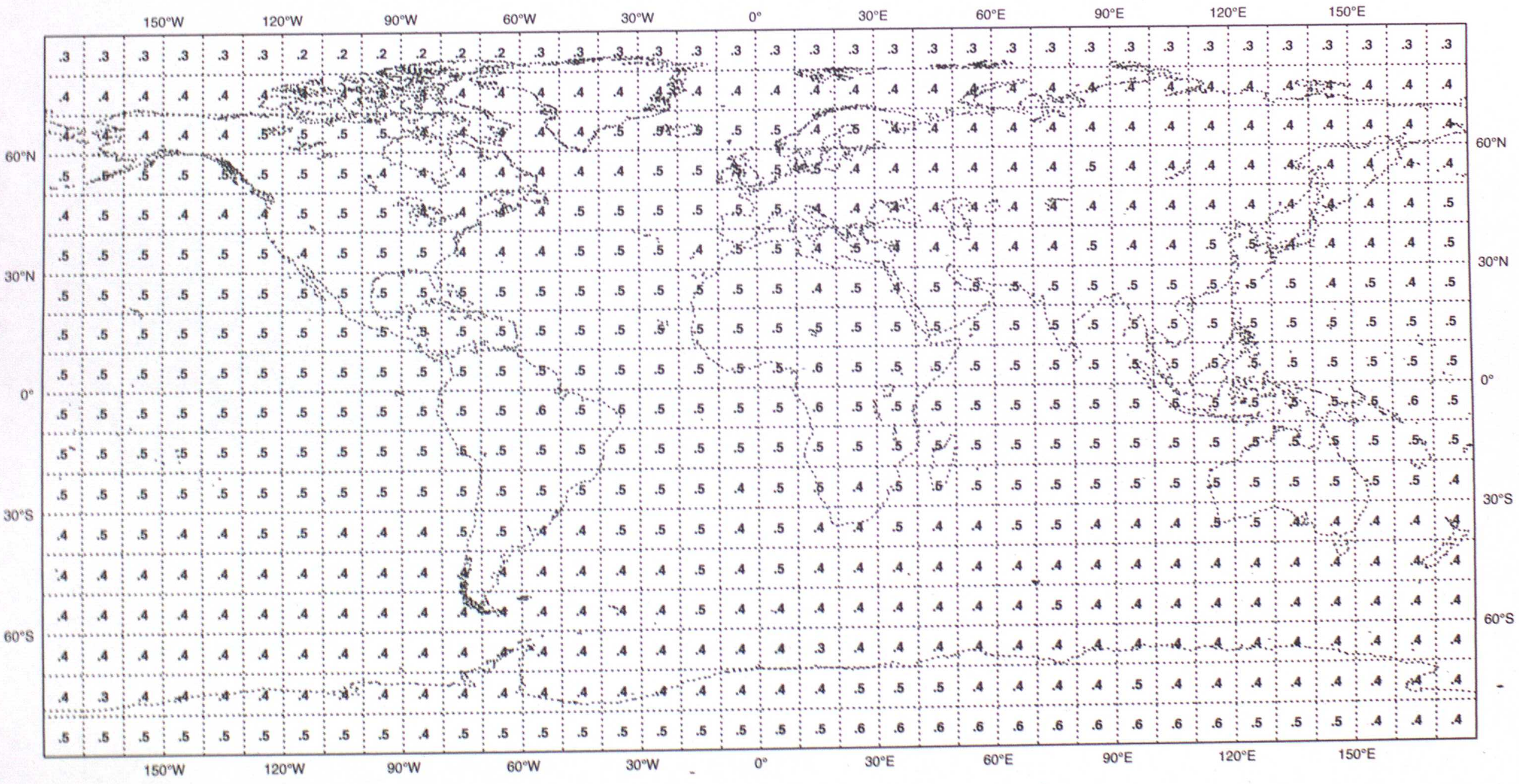

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

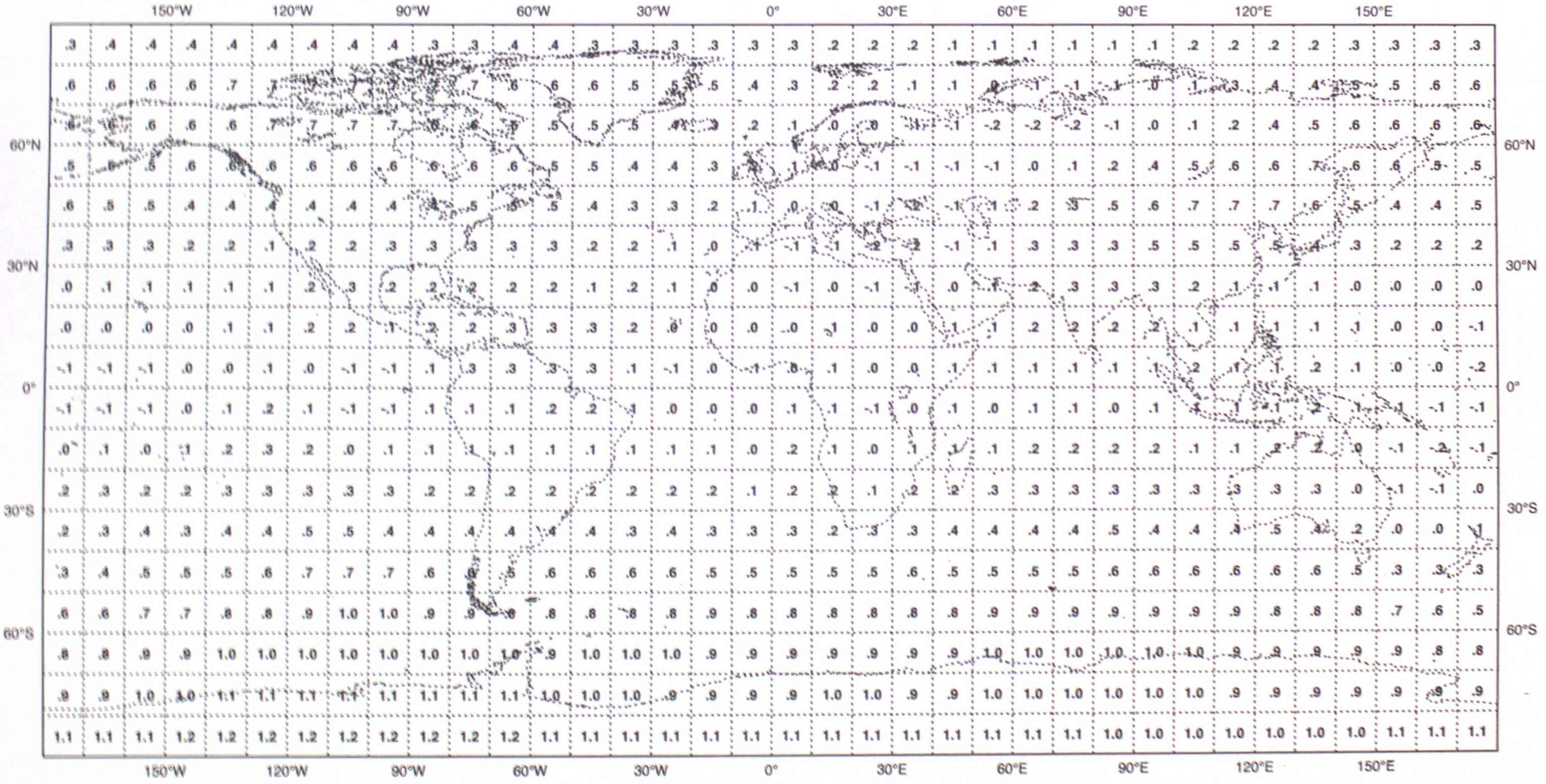

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .2 .2 .2 .1 .1 .1 .1 .1 .1 .2 .2 .2 .2 .3 .3 .3 .3
.6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .6 .6 .6 .5 .5 .5 .4 .3 .2 .2 .1 .1 .0 -.1 -.1 -.1 .0 .1 .3 .4 .4 .5 .5 .6 .6
.6 .6 .6 .6 .6 .7 .7 .7 .7 .6 .6 .5 .5 .5 .5 .4 .3 .2 .1 .0 .0 -.1 -.1 -.2 -.2 -.2 -.1 .0 .1 .2 .4 .5 .6 .6 .6 .6
.5 .6 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .4 .4 .3 .2 .1 .0 -.1 -.1 -.1 -.1 .0 .1 .2 .4 .5 .6 .6 .7 .6 .6 .5 .5
.6 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .3 .3 .2 .1 .0 .0 -.1 .2 -.1 .1 .2 .3 .5 .6 .7 .7 .7 .6 .5 .4 .4 .5
.3 .3 .3 .2 .2 .1 .2 .2 .3 .3 .3 .3 .3 .2 .2 .1 .0 -.1 -.1 -.1 -.2 -.2 -.1 .1 .3 .3 .3 .5 .5 .5 .5 .4 .3 .2 .2 .2
.0 .1 .1 .1 .1 .1 .2 .3 .2 .2 .2 .2 .2 .1 .2 .1 .0 .0 -.1 .0 -.1 -.1 .0 .1 .2 .3 .3 .3 .2 .1 .1 .1 .0 .0 .0 .0
.0 .0 .0 .0 .1 .1 .2 .2 .1 .2 .2 .3 .3 .3 .2 .0 .0 .0 .0 .1 .0 .0 .1 .1 .2 .2 .2 .2 .1 .1 .1 .1 .1 .0 .0 -.1
-.1 -.1 -.1 .0 .0 .1 .0 -.1 -.1 .1 .3 .3 .3 .3 .1 -.1 .0 -.1 .0 .1 .0 .0 .1 .1 .1 .1 .1 .1 .2 .1 .1 .2 .1 .0 .0 -.2
-.1 -.1 -.1 .0 .1 .2 .1 -.1 -.1 .1 .1 .1 .2 .2 .1 .0 .0 .0 .1 .1 -.1 .0 .1 .0 .1 .1 .0 .1 .1 .1 .1 .2 .1 .1 -.1 -.1
.0 .1 .0 .1 .2 .3 .2 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .2 .1 .0 .1 .1 .1 .2 .2 .2 .2 .1 .1 .2 .2 .0 -.1 -.2 -.1
.2 .3 .2 .2 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .1 .2 .2 .1 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .0 -.1 -.1 .0
.2 .3 .4 .3 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .3 .2 .3 .3 .4 .4 .4 .4 .5 .4 .4 .4 .5 .4 .2 .0 .0 .1
.3 .4 .5 .5 .5 .6 .7 .7 .7 .6 .6 .5 .6 .6 .6 .6 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .5 .3 .3 .3
.6 .6 .7 .7 .8 .8 .9 1.0 1.0 .9 .9 .8 .8 .8 .8 .8 .9 .8 .8 .8 .8 .8 .8 .9 .9 .9 .9 .9 .9 .9 .8 .8 .8 .7 .6 .5
.8 .8 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 1.0 1.0 1.0 .9 .9 .9 .9 .9 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 .9 .9 .9 .9 .9 .8 .8
.9 .9 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 .9 .9 .9 .9 1.0 1.0 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 .9 .9 .9 .9 .9 .9 .9
1.1 1.1 1.1 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

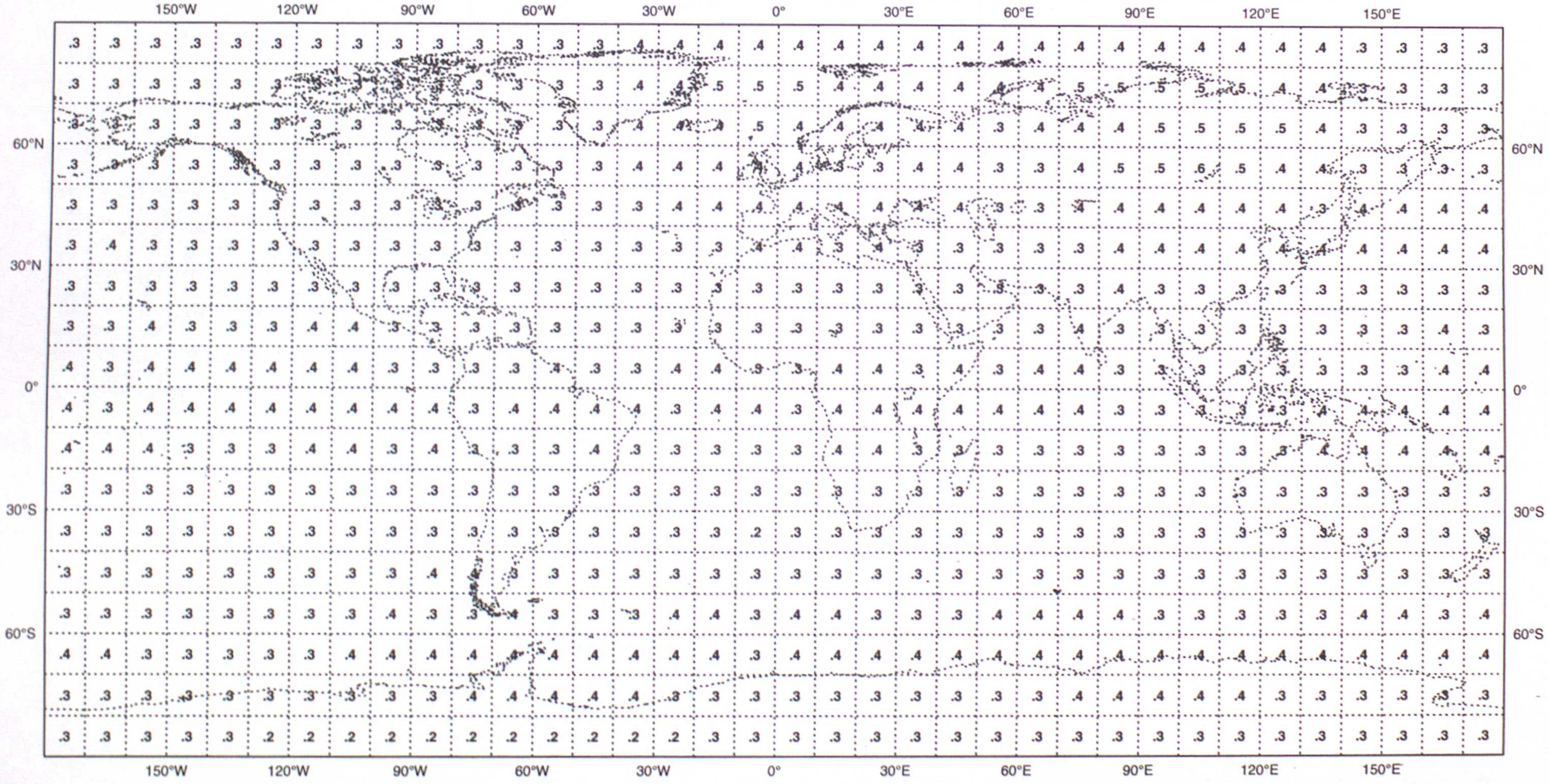
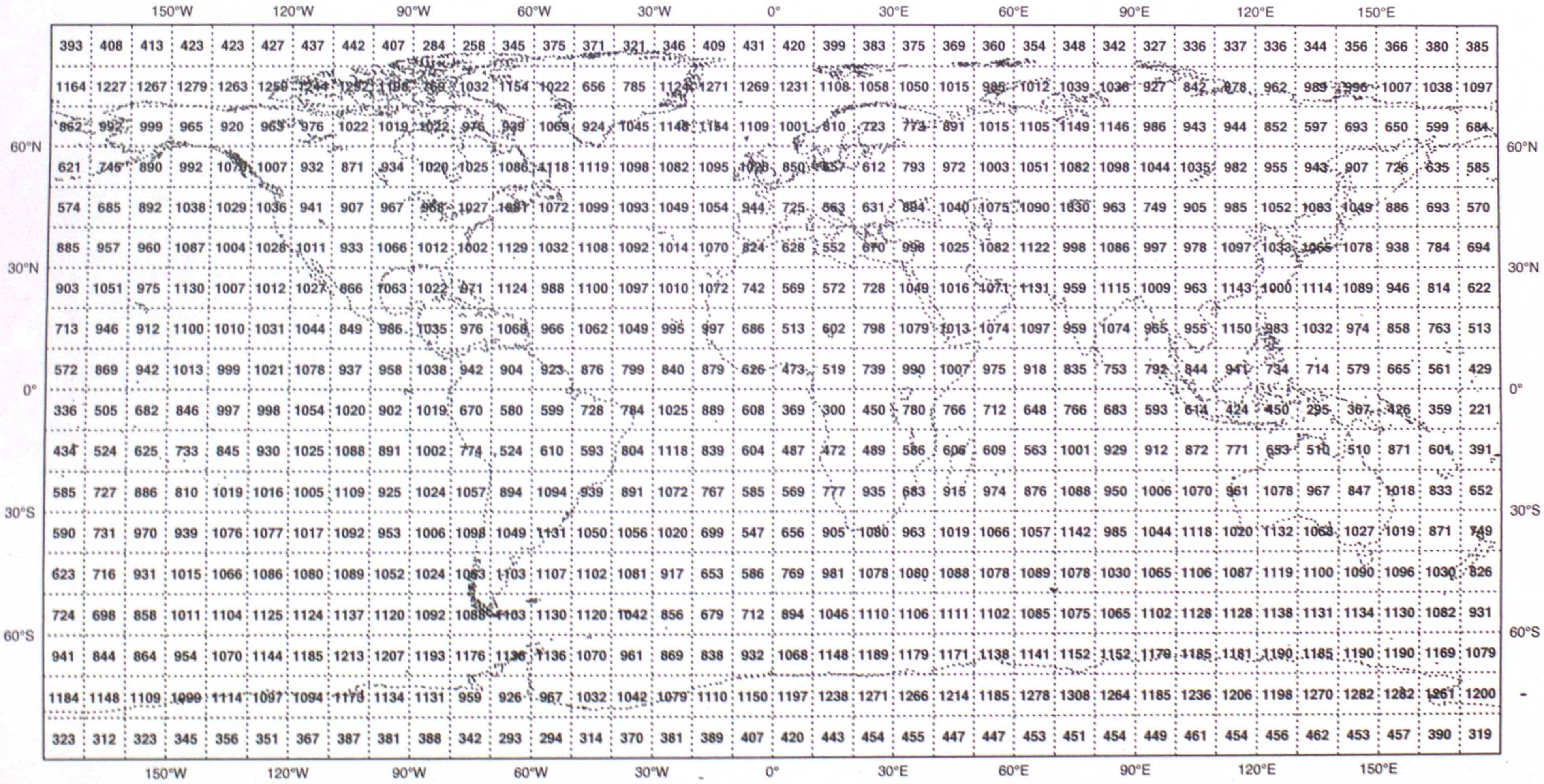
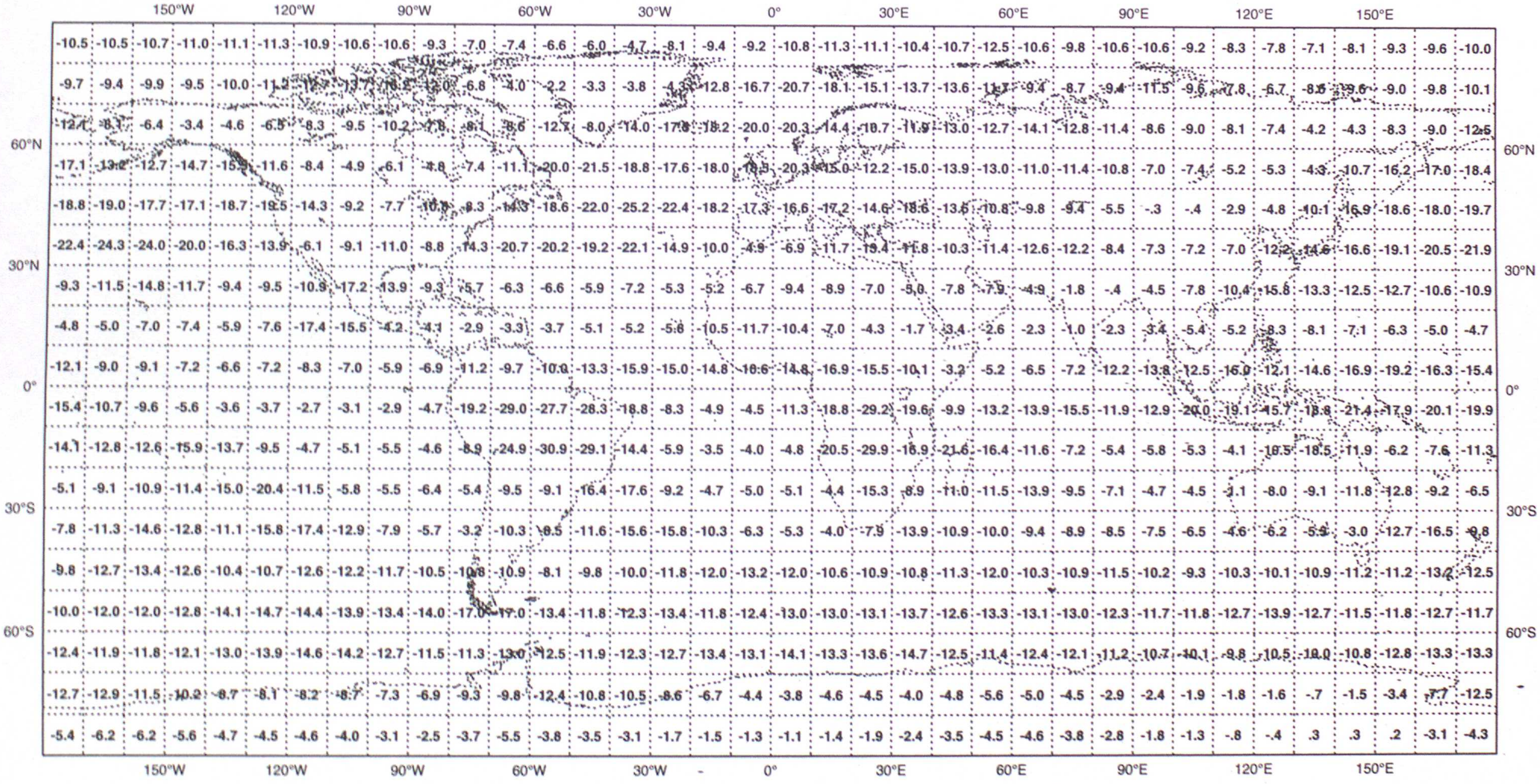

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .5 .4 .4 .4 .4 .4 .3 .4 .4 .4 .5 .5 .5 .5 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .4 .4 .3 .3 .4 .5 .5 .6 .5 .4 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4
.3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .4 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3
.4 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .4 .4 .3 .3 .4 .4 .3 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4
.4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4
.4 .4 .4 .3 .3 .3 .4 .4 .3 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .3 .4 .4 .3 .4 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .3 .4
.4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3

Figure 40. ATOVS mean daily count. JANUARY 2004
NOAA16, using all observations
Global average number of observations in 24 hours = 572399



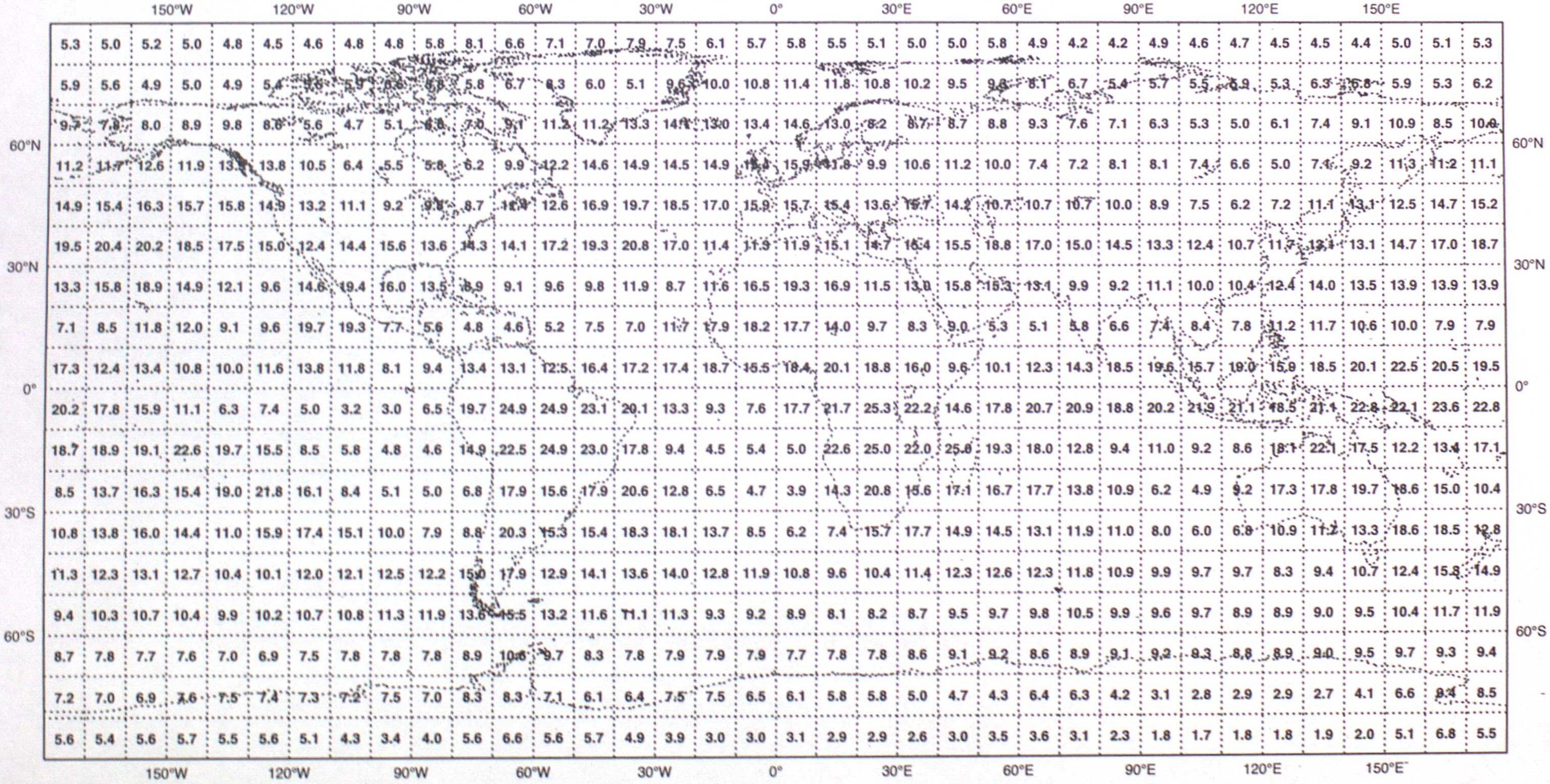
393	408	413	423	423	427	437	442	407	284	258	345	375	371	321	346	409	431	420	399	383	375	369	360	354	348	342	327	336	337	336	344	356	366	380	385
1164	1227	1267	1279	1263	1250	1244	1292	1106	769	1032	1154	1022	656	785	1124	1271	1269	1231	1108	1058	1050	1015	985	1012	1039	1036	927	842	878	962	989	996	1007	1038	1097
862	992	999	965	920	963	976	1022	1019	1022	976	939	1069	924	1045	1148	1184	1109	1001	810	723	773	891	1015	1105	1149	1146	986	943	944	852	597	693	650	599	684
621	746	890	992	1070	1007	932	871	934	1020	1025	1086	1118	1119	1098	1082	1095	1028	850	857	612	793	972	1003	1051	1082	1098	1044	1035	982	955	943	907	726	635	585
574	685	892	1038	1029	1036	941	907	967	968	1027	1081	1072	1099	1093	1049	1054	944	725	563	631	894	1040	1075	1090	1030	963	749	905	985	1052	1083	1049	886	693	570
885	957	960	1087	1004	1028	1011	933	1066	1012	1002	1129	1032	1108	1092	1014	1070	824	628	552	670	998	1025	1082	1122	998	1086	997	978	1097	1033	1065	1078	938	784	694
903	1051	975	1130	1007	1012	1027	866	1063	1022	971	1124	988	1100	1097	1010	1072	742	569	572	728	1049	1016	1071	1131	959	1115	1009	963	1143	1000	1114	1089	946	814	622
713	946	912	1100	1010	1031	1044	849	986	1035	976	1068	966	1062	1049	995	997	686	513	602	798	1079	1013	1074	1097	959	1074	965	955	1150	983	1032	974	858	763	513
572	869	942	1013	999	1021	1078	937	958	1038	942	904	923	876	799	840	879	626	473	519	739	990	1007	975	918	835	753	792	844	941	734	714	579	665	561	429
336	505	682	846	997	998	1054	1020	902	1019	670	580	599	728	784	1025	889	608	369	300	450	780	766	712	648	766	683	593	614	424	450	295	367	426	359	221
434	524	625	733	845	930	1025	1088	891	1002	774	524	610	593	804	1118	839	604	487	472	489	586	606	609	563	1001	929	912	872	771	653	510	510	871	601	391
585	727	886	810	1019	1016	1005	1109	925	1024	1057	894	1094	939	891	1072	767	585	569	777	935	683	915	974	876	1088	950	1006	1070	961	1078	967	847	1018	833	652
590	731	970	939	1076	1077	1017	1092	953	1006	1098	1049	1131	1050	1056	1020	699	547	656	905	1080	963	1019	1066	1057	1142	985	1044	1118	1020	1132	1063	1027	1019	871	749
623	716	931	1015	1066	1086	1080	1089	1052	1024	1063	1103	1107	1102	1081	917	653	586	769	981	1078	1080	1088	1078	1089	1078	1030	1065	1106	1087	1119	1100	1090	1096	1030	826
724	698	858	1011	1104	1125	1124	1137	1120	1092	1088	1103	1130	1120	1042	856	679	712	894	1046	1110	1106	1111	1102	1085	1075	1065	1102	1128	1128	1138	1131	1134	1130	1082	931
941	844	864	954	1070	1144	1185	1213	1207	1193	1176	1136	1136	1070	961	869	838	932	1068	1148	1189	1179	1171	1138	1141	1152	1152	1179	1185	1181	1190	1185	1190	1190	1169	1079
1184	1148	1109	1099	1114	1097	1094	1173	1134	1131	959	926	967	1032	1042	1079	1110	1150	1197	1238	1271	1266	1214	1185	1278	1308	1264	1185	1236	1206	1198	1270	1282	1282	1261	1200
323	312	323	345	356	351	367	387	381	388	342	293	294	314	370	381	389	407	420	443	454	455	447	447	453	451	454	449	461	454	456	462	453	457	390	319

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



-10.5	-10.5	-10.7	-11.0	-11.1	-11.3	-10.9	-10.6	-10.6	-9.3	-7.0	-7.4	-6.6	-6.0	-4.7	-8.1	-9.4	-9.2	-10.8	-11.3	-11.1	-10.4	-10.7	-12.5	-10.6	-9.8	-10.6	-10.6	-9.2	-8.3	-7.8	-7.1	-8.1	-9.3	-9.6	-10.0
-9.7	-9.4	-9.9	-9.5	-10.0	-11.2	-12.7	-13.7	-16.2	-12.0	-6.8	-4.0	-2.2	-3.3	-3.8	-4.3	-12.8	-16.7	-20.7	-18.1	-15.1	-13.7	-13.6	-11.7	-9.4	-8.7	-9.4	-11.5	-9.6	-7.8	-6.7	-8.6	-9.6	-9.0	-9.8	-10.1
-12.1	-8.1	-6.4	-3.4	-4.6	-6.5	-8.3	-9.5	-10.2	-7.8	-8.1	-8.6	-12.7	-8.0	-14.0	-17.8	-18.2	-20.0	-20.3	-14.4	-10.7	-11.9	-13.0	-12.7	-14.1	-12.8	-11.4	-8.6	-9.0	-8.1	-7.4	-4.2	-4.3	-8.3	-9.0	-12.5
-17.1	-13.2	-12.7	-14.7	-15.9	-11.6	-8.4	-4.9	-6.1	-4.8	-7.4	-11.1	-20.0	-21.5	-18.8	-17.6	-18.0	-18.5	-20.3	-15.0	-12.2	-15.0	-13.9	-13.0	-11.0	-11.4	-10.8	-7.0	-7.4	-5.2	-5.3	-4.3	-10.7	-16.2	-17.0	-18.4
-18.8	-19.0	-17.7	-17.1	-18.7	-19.5	-14.3	-9.2	-7.7	-10.8	-8.3	-14.3	-18.6	-22.0	-25.2	-22.4	-18.2	-17.3	-16.6	-17.2	-14.6	-18.6	-13.6	-10.8	-9.8	-9.4	-5.5	-.3	-.4	-2.9	-4.8	-10.1	-16.9	-18.6	-18.0	-19.7
-22.4	-24.3	-24.0	-20.0	-16.3	-13.9	-6.1	-9.1	-11.0	-8.8	-14.3	-20.7	-20.2	-19.2	-22.1	-14.9	-10.0	-4.9	-6.9	-11.7	-19.4	-11.8	-10.3	-11.4	-12.6	-12.2	-8.4	-7.3	-7.2	-7.0	-12.2	-14.6	-16.6	-19.1	-20.5	-21.9
-9.3	-11.5	-14.8	-11.7	-9.4	-9.5	-10.9	-17.2	-13.9	-9.3	-5.7	-6.3	-6.6	-5.9	-7.2	-5.3	-5.2	-6.7	-9.4	-8.9	-7.0	-5.0	-7.8	-7.9	-4.9	-1.8	-.4	-4.5	-7.8	-10.4	-15.8	-13.3	-12.5	-12.7	-10.6	-10.9
-4.8	-5.0	-7.0	-7.4	-5.9	-7.6	-17.4	-15.5	-4.2	-4.1	-2.9	-3.3	-3.7	-5.1	-5.2	-5.8	-10.5	-11.7	-10.4	-7.0	-4.3	-1.7	-3.4	-2.6	-2.3	-1.0	-2.3	-3.4	-5.4	-5.2	-8.3	-8.1	-7.1	-6.3	-5.0	-4.7
-12.1	-9.0	-9.1	-7.2	-6.6	-7.2	-8.3	-7.0	-5.9	-6.9	-11.2	-9.7	-10.0	-13.3	-15.9	-15.0	-14.8	-16.6	-14.8	-16.9	-15.5	-10.1	-3.2	-5.2	-6.5	-7.2	-12.2	-13.8	-12.5	-16.0	-12.1	-14.6	-16.9	-19.2	-16.3	-15.4
-15.4	-10.7	-9.6	-5.6	-3.6	-3.7	-2.7	-3.1	-2.9	-4.7	-19.2	-29.0	-27.7	-28.3	-18.8	-8.3	-4.9	-4.5	-11.3	-18.8	-29.2	-19.6	-9.9	-13.2	-13.9	-15.5	-11.9	-12.9	-20.0	-19.1	-15.7	-18.8	-21.4	-17.9	-20.1	-19.9
-14.1	-12.8	-12.6	-15.9	-13.7	-9.5	-4.7	-5.1	-5.5	-4.6	-8.9	-24.9	-30.9	-29.1	-14.4	-5.9	-3.5	-4.0	-4.8	-20.5	-29.9	-16.9	-21.6	-16.4	-11.6	-7.2	-5.4	-5.8	-5.3	-4.1	-10.5	-18.5	-11.9	-6.2	-7.6	-11.3
-5.1	-9.1	-10.9	-11.4	-15.0	-20.4	-11.5	-5.8	-5.5	-6.4	-5.4	-9.5	-9.1	-16.4	-17.6	-9.2	-4.7	-5.0	-5.1	-4.4	-15.3	-8.9	-11.0	-11.5	-13.9	-9.5	-7.1	-4.7	-4.5	-1.1	-8.0	-9.1	-11.8	-12.8	-9.2	-6.5
-7.8	-11.3	-14.6	-12.8	-11.1	-15.8	-17.4	-12.9	-7.9	-5.7	-3.2	-10.3	-8.5	-11.6	-15.6	-15.8	-10.3	-6.3	-5.3	-4.0	-7.9	-13.9	-10.9	-10.0	-9.4	-8.9	-8.5	-7.5	-6.5	-4.6	-6.2	-5.5	-3.0	-12.7	-16.5	-9.8
-9.8	-12.7	-13.4	-12.6	-10.4	-10.7	-12.6	-12.2	-11.7	-10.5	-10.8	-10.9	-8.1	-9.8	-10.0	-11.8	-12.0	-13.2	-12.0	-10.6	-10.9	-10.8	-11.3	-12.0	-10.3	-10.9	-11.5	-10.2	-9.3	-10.3	-10.1	-10.9	-11.2	-11.2	-13.2	-12.5
-10.0	-12.0	-12.0	-12.8	-14.1	-14.7	-14.4	-13.9	-13.4	-14.0	-17.0	-17.0	-13.4	-11.8	-12.3	-13.4	-11.8	-12.4	-13.0	-13.0	-13.1	-13.7	-12.6	-13.3	-13.1	-13.0	-12.3	-11.7	-11.8	-12.7	-13.9	-12.7	-11.5	-11.8	-12.7	-11.7
-12.4	-11.9	-11.8	-12.1	-13.0	-13.9	-14.6	-14.2	-12.7	-11.5	-11.3	-13.0	-12.5	-11.9	-12.3	-12.7	-13.4	-13.1	-14.1	-13.3	-13.6	-14.7	-12.5	-11.4	-12.4	-12.1	-11.2	-10.7	-10.1	-9.8	-10.5	-10.0	-10.8	-12.8	-13.3	-13.3
-12.7	-12.9	-11.5	-10.2	-8.7	-8.1	-8.2	-8.7	-7.3	-6.9	-9.3	-9.8	-12.4	-10.8	-10.5	-8.6	-6.7	-4.4	-3.8	-4.6	-4.5	-4.0	-4.8	-5.6	-5.0	-4.5	-2.9	-2.4	-1.9	-1.8	-1.6	-.7	-1.5	-3.4	-7.7	-12.5
-5.4	-6.2	-6.2	-5.6	-4.7	-4.5	-4.6	-4.0	-3.1	-2.5	-3.7	-5.5	-3.8	-3.5	-3.1	-1.7	-1.5	-1.3	-1.1	-1.4	-1.9	-2.4	-3.5	-4.5	-4.6	-3.8	-2.8	-1.8	-1.3	-.8	-.4	.3	.3	.2	-3.1	-4.3

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



5.3	5.0	5.2	5.0	4.8	4.5	4.6	4.8	4.8	5.8	8.1	6.6	7.1	7.0	7.9	7.5	6.1	5.7	5.8	5.5	5.1	5.0	5.0	5.8	4.9	4.2	4.2	4.9	4.6	4.7	4.5	4.5	4.4	5.0	5.1	5.3
5.9	5.6	4.9	5.0	4.9	5.4	5.6	5.9	6.6	6.8	5.8	6.7	6.3	6.0	5.1	9.6	10.0	10.8	11.4	11.8	10.8	10.2	9.5	9.6	8.1	6.7	5.4	5.7	5.5	5.9	5.3	6.3	6.8	5.9	5.3	6.2
9.7	7.8	8.0	8.9	9.8	8.6	5.6	4.7	5.1	6.8	7.0	9.1	11.2	11.2	13.3	14.1	13.0	13.4	14.6	13.0	8.2	8.7	8.7	8.8	9.3	7.6	7.1	6.3	5.3	5.0	6.1	7.4	9.1	10.9	8.5	10.6
11.2	11.7	12.6	11.9	[illegible]	13.8	10.5	6.4	5.5	5.8	6.2	9.9	12.2	14.6	14.9	14.5	14.9	15.4	15.9	11.8	9.9	10.6	11.2	10.0	7.4	7.2	8.1	8.1	7.4	6.6	5.0	7.4	9.2	11.3	11.2	11.1
14.9	15.4	16.3	15.7	15.8	14.9	13.2	11.1	9.2	9.8	8.7	11.9	12.6	16.9	19.7	18.5	17.0	15.9	15.7	15.4	13.6	15.7	14.2	10.7	10.7	10.7	10.0	8.9	7.5	6.2	7.2	11.1	13.1	12.5	14.7	15.2
19.5	20.4	20.2	18.5	17.5	15.0	12.4	14.4	15.6	13.6	14.3	14.1	17.2	19.3	20.8	17.0	11.4	11.9	11.9	15.1	14.7	16.4	15.5	18.8	17.0	15.0	14.5	13.3	12.4	10.7	11.7	13.1	13.1	14.7	17.0	18.7
13.3	15.8	18.9	14.9	12.1	9.6	14.6	19.4	16.0	13.5	8.9	9.1	9.6	9.8	11.9	8.7	11.6	16.5	19.3	16.9	11.5	13.0	15.8	15.3	13.1	9.9	9.2	11.1	10.0	10.4	12.4	14.0	13.5	13.9	13.9	13.9
7.1	8.5	11.8	12.0	9.1	9.6	19.7	19.3	7.7	5.6	4.8	4.6	5.2	7.5	7.0	11.7	17.9	18.2	17.7	14.0	9.7	8.3	9.0	5.3	5.1	5.8	6.6	7.4	8.4	7.8	11.2	11.7	10.6	10.0	7.9	7.9
17.3	12.4	13.4	10.8	10.0	11.6	13.8	11.8	8.1	9.4	13.4	13.1	12.5	16.4	17.2	17.4	18.7	15.5	18.4	20.1	18.8	16.0	9.6	10.1	12.3	14.3	18.5	19.6	15.7	19.0	15.9	18.5	20.1	22.5	20.5	19.5
20.2	17.8	15.9	11.1	6.3	7.4	5.0	3.2	3.0	6.5	19.7	24.9	24.9	23.1	20.1	13.3	9.3	7.6	17.7	21.7	25.3	22.2	14.6	17.8	20.7	20.9	18.8	20.2	21.9	21.1	18.5	21.1	22.8	22.1	23.6	22.8
18.7	18.9	19.1	22.6	19.7	15.5	8.5	5.8	4.8	4.6	14.9	22.5	24.9	23.0	17.8	9.4	4.5	5.4	5.0	22.6	25.0	22.0	25.6	19.3	18.0	12.8	9.4	11.0	9.2	8.6	18.1	22.1	17.5	12.2	13.4	17.1
8.5	13.7	16.3	15.4	19.0	21.8	16.1	8.4	5.1	5.0	6.8	17.9	15.6	17.9	20.6	12.8	6.5	4.7	3.9	14.3	20.8	15.6	17.1	16.7	17.7	13.8	10.9	6.2	4.9	9.2	17.3	17.8	19.7	18.6	15.0	10.4
10.8	13.8	16.0	14.4	11.0	15.9	17.4	15.1	10.0	7.9	8.8	20.3	15.3	15.4	18.3	18.1	13.7	8.5	6.2	7.4	15.7	17.7	14.9	14.5	13.1	11.9	11.0	8.0	6.0	6.8	10.9	11.2	13.3	18.6	18.5	12.8
11.3	12.3	13.1	12.7	10.4	10.1	12.0	12.1	12.5	12.2	15.0	17.9	12.9	14.1	13.6	14.0	12.8	11.9	10.8	9.6	10.4	11.4	12.3	12.6	12.3	11.8	10.9	9.9	9.7	9.7	8.3	9.4	10.7	12.4	15.8	14.9
9.4	10.3	10.7	10.4	9.9	10.2	10.7	10.8	11.3	11.9	13.6	15.5	13.2	11.6	11.1	11.3	9.3	9.2	8.9	8.1	8.2	8.7	9.5	9.7	9.8	10.5	9.9	9.6	9.7	8.9	8.9	9.0	9.5	10.4	11.7	11.9
8.7	7.8	7.7	7.6	7.0	6.9	7.5	7.8	7.8	7.8	8.9	10.6	9.7	8.3	7.8	7.9	7.9	7.9	7.7	7.8	7.8	8.6	9.1	9.2	8.6	8.9	9.1	9.2	8.3	8.8	8.9	9.0	9.5	9.7	9.3	9.4
7.2	7.0	6.9	7.6	7.5	7.4	7.3	7.2	7.5	7.0	8.3	8.3	7.1	6.1	6.4	7.5	7.5	6.5	6.1	5.8	5.8	5.0	4.7	4.3	6.4	6.3	4.2	3.1	2.8	2.9	2.9	2.7	4.1	6.6	9.4	8.5
5.6	5.4	5.6	5.7	5.5	5.6	5.1	4.3	3.4	4.0	5.6	6.6	5.6	5.7	4.9	3.9	3.0	3.0	3.1	2.9	2.9	2.6	3.0	3.5	3.6	3.1	2.3	1.8	1.7	1.8	1.8	1.9	2.0	5.1	6.8	5.5

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

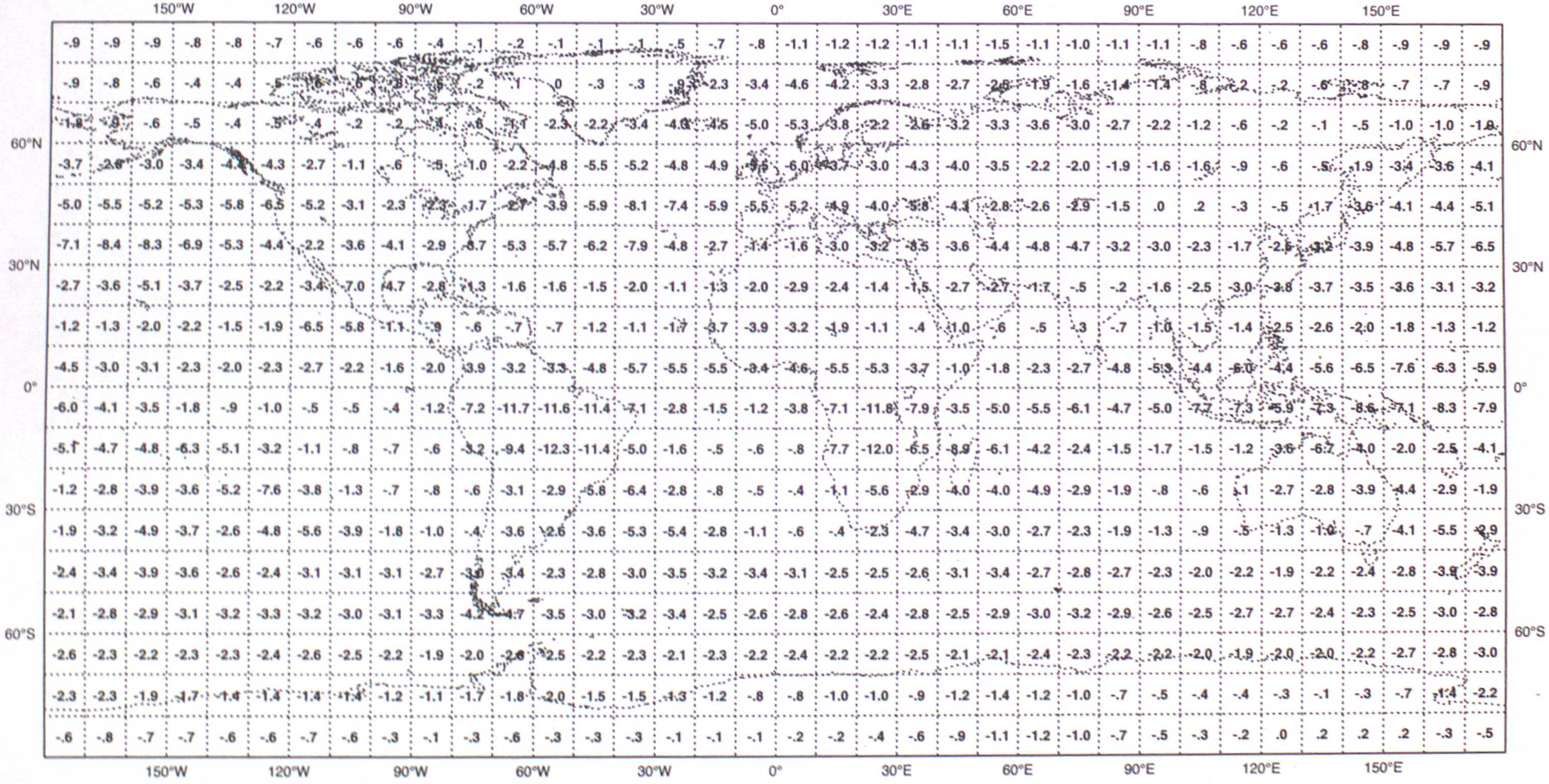
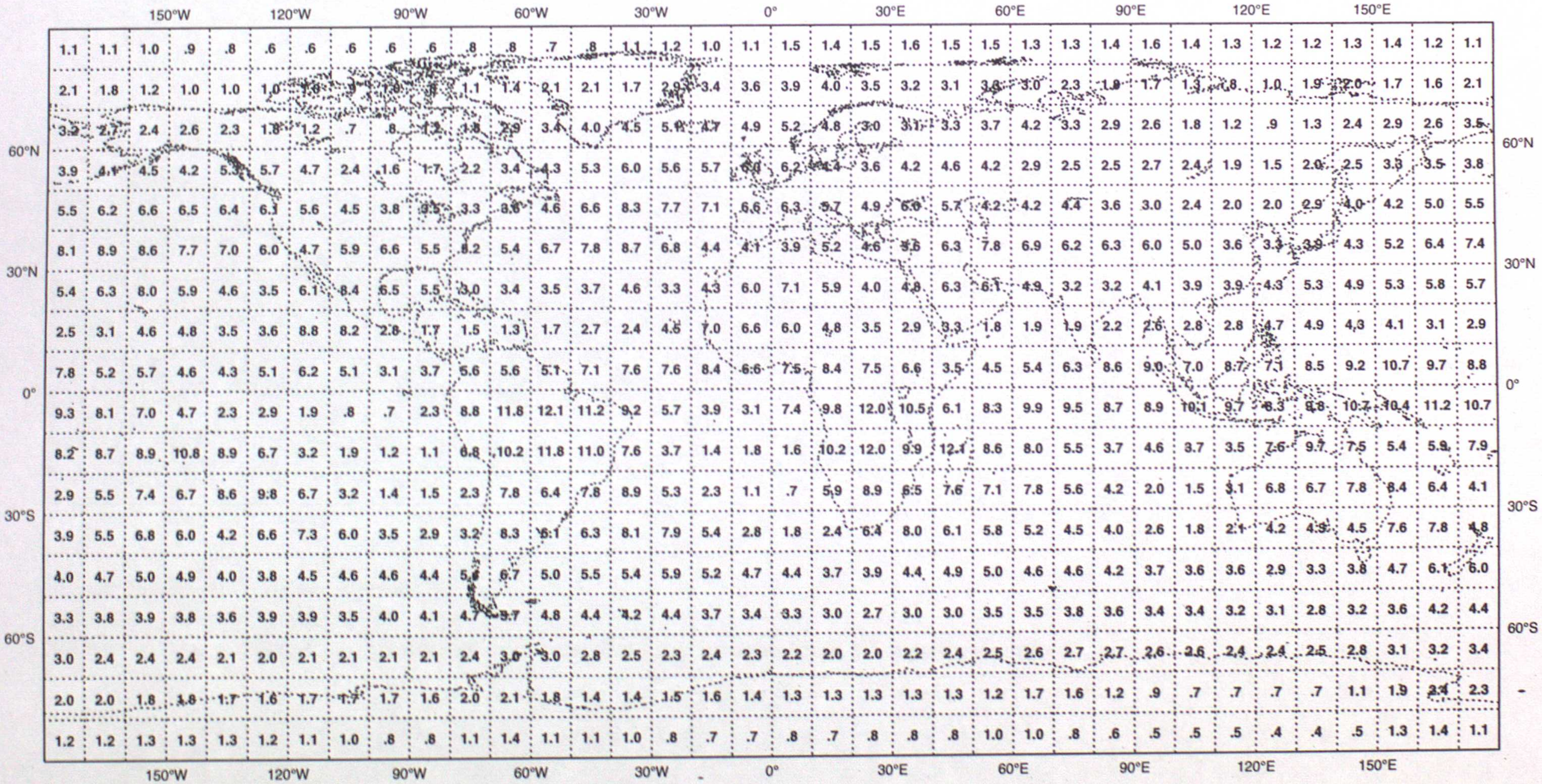

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.9 -.9 -.9 -.8 -.8 -.7 -.6 -.6 -.6 -.4 -.1 -.2 -.1 -.1 -.1 -.5 -.7 -.8 -1.1 -1.2 -1.2 -1.1 -1.1 -1.5 -1.1 -1.0 -1.1 -1.1 -.8 -.6 -.6 -.6 -.8 -.9 -.9 -.9
-.9 -.8 -.6 -.4 -.4 -.5 -.6 -.5 -.3 -.6 -.2 .1 .0 -.3 -.3 -.9 -2.3 -3.4 -4.6 -4.2 -3.3 -2.8 -2.7 -2.6 -1.9 -1.6 -1.4 -1.4 -.8 -.2 -.2 -.6 -.8 -.7 -.7 -.9
-1.8 -.9 -.6 -.5 -.4 -.5 -.4 -.2 -.2 -.4 -.6 -1.1 -2.3 -2.2 -3.4 -4.0 -4.5 -5.0 -5.3 -3.8 -2.2 -2.6 -3.2 -3.3 -3.6 -3.0 -2.7 -2.2 -1.2 -.6 -.2 -.1 -.5 -1.0 -1.0 -1.9
-3.7 -2.6 -3.0 -3.4 -4.4 -4.3 -2.7 -1.1 -.6 -.5 -1.0 -2.2 -4.8 -5.5 -5.2 -4.8 -4.9 -5.5 -6.0 -3.7 -3.0 -4.3 -4.0 -3.5 -2.2 -2.0 -1.9 -1.6 -1.6 -.9 -.6 -.5 -1.9 -3.4 -3.6 -4.1
-5.0 -5.5 -5.2 -5.3 -5.8 -6.5 -5.2 -3.1 -2.3 -2.3 -1.7 -2.7 -3.9 -5.9 -8.1 -7.4 -5.9 -5.5 -5.2 -4.9 -4.0 -5.8 -4.3 -2.8 -2.6 -2.9 -1.5 .0 .2 -.3 -.5 -1.7 -3.6 -4.1 -4.4 -5.1
-7.1 -8.4 -8.3 -6.9 -5.3 -4.4 -2.2 -3.6 -4.1 -2.9 -3.7 -5.3 -5.7 -6.2 -7.9 -4.8 -2.7 -1.4 -1.6 -3.0 -3.2 -3.5 -3.6 -4.4 -4.8 -4.7 -3.2 -3.0 -2.3 -1.7 -2.5 -3.2 -3.9 -4.8 -5.7 -6.5
-2.7 -3.6 -5.1 -3.7 -2.5 -2.2 -3.4 -7.0 -4.7 -2.8 -1.3 -1.6 -1.6 -1.5 -2.0 -1.1 -1.3 -2.0 -2.9 -2.4 -1.4 -1.5 -2.7 -2.7 -1.7 -.5 -.2 -1.6 -2.5 -3.0 -3.8 -3.7 -3.5 -3.6 -3.1 -3.2
-1.2 -1.3 -2.0 -2.2 -1.5 -1.9 -6.5 -5.8 -1.1 -.9 -.6 -.7 -.7 -1.2 -1.1 -1.7 -3.7 -3.9 -3.2 -1.9 -1.1 -.4 -1.0 -.6 -.5 -.3 -.7 -1.0 -1.5 -1.4 -2.5 -2.6 -2.0 -1.8 -1.3 -1.2
-4.5 -3.0 -3.1 -2.3 -2.0 -2.3 -2.7 -2.2 -1.6 -2.0 -3.9 -3.2 -3.3 -4.8 -5.7 -5.5 -5.5 -3.4 -4.6 -5.5 -5.3 -3.7 -1.0 -1.8 -2.3 -2.7 -4.8 -5.3 -4.4 -6.0 -4.4 -5.6 -6.5 -7.6 -6.3 -5.9
-6.0 -4.1 -3.5 -1.8 -.9 -1.0 -.5 -.5 -.4 -1.2 -7.2 -11.7 -11.6 -11.4 -7.1 -2.8 -1.5 -1.2 -3.8 -7.1 -11.8 -7.9 -3.5 -5.0 -5.5 -6.1 -4.7 -5.0 -7.7 -7.3 -5.9 -7.3 -8.6 -7.1 -8.3 -7.9
-5.1 -4.7 -4.8 -6.3 -5.1 -3.2 -1.1 -.8 -.7 -.6 -3.2 -9.4 -12.3 -11.4 -5.0 -1.6 -.5 -.6 -.8 -7.7 -12.0 -6.5 -8.9 -6.1 -4.2 -2.4 -1.5 -1.7 -1.5 -1.2 -3.6 -6.7 -4.0 -2.0 -2.5 -4.1
-1.2 -2.8 -3.9 -3.6 -5.2 -7.6 -3.8 -1.3 -.7 -.8 -.6 -3.1 -2.9 -5.8 -6.4 -2.8 -.8 -.5 -.4 -1.1 -5.6 -2.9 -4.0 -4.0 -4.9 -2.9 -1.9 -.8 -.6 .1 -2.7 -2.8 -3.9 -4.4 -2.9 -1.9
-1.9 -3.2 -4.9 -3.7 -2.6 -4.8 -5.6 -3.9 -1.8 -1.0 -.4 -3.6 -2.6 -3.6 -5.3 -5.4 -2.8 -1.1 -.6 -.4 -2.3 -4.7 -3.4 -3.0 -2.7 -2.3 -1.9 -1.3 -.9 -.5 -1.3 -1.0 -.7 -4.1 -5.5 -2.9
-2.4 -3.4 -3.9 -3.6 -2.6 -2.4 -3.1 -3.1 -3.1 -2.7 -3.0 -3.4 -2.3 -2.8 -3.0 -3.5 -3.2 -3.4 -3.1 -2.5 -2.5 -2.6 -3.1 -3.4 -2.7 -2.8 -2.7 -2.3 -2.0 -2.2 -1.9 -2.2 -2.4 -2.8 -3.9 -3.9
-2.1 -2.8 -2.9 -3.1 -3.2 -3.3 -3.2 -3.0 -3.1 -3.3 -4.2 -4.7 -3.5 -3.0 -3.2 -3.4 -2.5 -2.6 -2.8 -2.6 -2.4 -2.8 -2.5 -2.9 -3.0 -3.2 -2.9 -2.6 -2.5 -2.7 -2.7 -2.4 -2.3 -2.5 -3.0 -2.8
-2.6 -2.3 -2.2 -2.3 -2.3 -2.4 -2.6 -2.5 -2.2 -1.9 -2.0 -2.6 -2.5 -2.2 -2.3 -2.1 -2.3 -2.2 -2.4 -2.2 -2.2 -2.5 -2.1 -2.1 -2.4 -2.3 -2.2 -2.2 -2.0 -1.9 -2.0 -2.0 -2.2 -2.7 -2.8 -3.0
-2.3 -2.3 -1.9 -1.7 -1.4 -1.4 -1.4 -1.4 -1.2 -1.1 -1.7 -1.8 -2.0 -1.5 -1.5 -1.3 -1.2 -.8 -.8 -1.0 -1.0 -.9 -1.2 -1.4 -1.2 -1.0 -.7 -.5 -.4 -.4 -.3 -.1 -.3 -.7 -1.4 -2.2
-.6 -.8 -.7 -.7 -.6 -.6 -.7 -.6 -.3 -.1 -.3 -.6 -.3 -.3 -.3 -.1 -.1 -.1 -.2 -.2 -.4 -.6 -.9 -1.1 -1.2 -1.0 -.7 -.5 -.3 -.2 .0 .2 .2 .2 -.3 -.5

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



1.1	1.1	1.0	.9	.8	.6	.6	.6	.6	.6	.8	.8	.7	.8	1.1	1.2	1.0	1.1	1.5	1.4	1.5	1.6	1.5	1.5	1.3	1.3	1.4	1.6	1.4	1.3	1.2	1.2	1.3	1.4	1.2	1.1
2.1	1.8	1.2	1.0	1.0	1.0	1.0	.9	1.0	.8	1.1	1.4	2.1	2.1	1.7	2.9	3.4	3.6	3.9	4.0	3.5	3.2	3.1	3.6	3.0	2.3	1.9	1.7	1.3	.8	1.0	1.9	2.0	1.7	1.6	2.1
3.2	2.7	2.4	2.6	2.3	1.8	1.2	.7	.8	1.2	1.8	2.9	3.4	4.0	4.5	5.1	4.7	4.9	5.2	4.8	3.0	3.1	3.3	3.7	4.2	3.3	2.9	2.6	1.8	1.2	.9	1.3	2.4	2.9	2.6	3.5
3.9	4.1	4.5	4.2	5.3	5.7	4.7	2.4	1.6	1.7	2.2	3.4	4.3	5.3	6.0	5.6	5.7	6.0	6.2	4.4	3.6	4.2	4.6	4.2	2.9	2.5	2.5	2.7	2.4	1.9	1.5	2.0	2.5	3.3	3.5	3.8
5.5	6.2	6.6	6.5	6.4	6.1	5.6	4.5	3.8	3.5	3.3	3.6	4.6	6.6	8.3	7.7	7.1	6.6	6.3	5.7	4.9	6.0	5.7	4.2	4.2	4.4	3.6	3.0	2.4	2.0	2.0	2.9	4.0	4.2	5.0	5.5
8.1	8.9	8.6	7.7	7.0	6.0	4.7	5.9	6.6	5.5	8.2	5.4	6.7	7.8	8.7	6.8	4.4	4.1	3.9	5.2	4.6	5.6	6.3	7.8	6.9	6.2	6.3	6.0	5.0	3.6	3.3	3.9	4.3	5.2	6.4	7.4
5.4	6.3	8.0	5.9	4.6	3.5	6.1	8.4	6.5	5.5	3.0	3.4	3.5	3.7	4.6	3.3	4.3	6.0	7.1	5.9	4.0	4.8	6.3	6.1	4.9	3.2	3.2	4.1	3.9	3.9	4.3	5.3	4.9	5.3	5.8	5.7
2.5	3.1	4.6	4.8	3.5	3.6	8.8	8.2	2.8	1.7	1.5	1.3	1.7	2.7	2.4	4.5	7.0	6.6	6.0	4.8	3.5	2.9	3.3	1.8	1.9	1.9	2.2	2.6	2.8	2.8	4.7	4.9	4.3	4.1	3.1	2.9
7.8	5.2	5.7	4.6	4.3	5.1	6.2	5.1	3.1	3.7	5.6	5.6	5.1	7.1	7.6	7.6	8.4	6.6	7.5	8.4	7.5	6.6	3.5	4.5	5.4	6.3	8.6	9.0	7.0	8.7	7.1	8.5	9.2	10.7	9.7	8.8
9.3	8.1	7.0	4.7	2.3	2.9	1.9	.8	.7	2.3	8.8	11.8	12.1	11.2	9.2	5.7	3.9	3.1	7.4	9.8	12.0	10.5	6.1	8.3	9.9	9.5	8.7	8.9	10.1	9.7	8.3	8.8	10.7	10.4	11.2	10.7
8.2	8.7	8.9	10.8	8.9	6.7	3.2	1.9	1.2	1.1	6.8	10.2	11.8	11.0	7.6	3.7	1.4	1.8	1.6	10.2	12.0	9.9	12.1	8.6	8.0	5.5	3.7	4.6	3.7	3.5	7.6	9.7	7.5	5.4	5.9	7.9
2.9	5.5	7.4	6.7	8.6	9.8	6.7	3.2	1.4	1.5	2.3	7.8	6.4	7.8	8.9	5.3	2.3	1.1	.7	5.9	8.9	6.5	7.6	7.1	7.8	5.6	4.2	2.0	1.5	3.1	6.8	6.7	7.8	8.4	6.4	4.1
3.9	5.5	6.8	6.0	4.2	6.6	7.3	6.0	3.5	2.9	3.2	8.3	6.1	6.3	8.1	7.9	5.4	2.8	1.8	2.4	6.4	8.0	6.1	5.8	5.2	4.5	4.0	2.6	1.8	2.1	4.2	4.3	4.5	7.6	7.8	4.8
4.0	4.7	5.0	4.9	4.0	3.8	4.5	4.6	4.6	4.4	5.6	6.7	5.0	5.5	5.4	5.9	5.2	4.7	4.4	3.7	3.9	4.4	4.9	5.0	4.6	4.6	4.2	3.7	3.6	3.6	2.9	3.3	3.8	4.7	6.1	6.0
3.3	3.8	3.9	3.8	3.6	3.9	3.9	3.5	4.0	4.1	4.7	3.7	4.8	4.4	4.2	4.4	3.7	3.4	3.3	3.0	2.7	3.0	3.0	3.5	3.5	3.8	3.6	3.4	3.4	3.2	3.1	2.8	3.2	3.6	4.2	4.4
3.0	2.4	2.4	2.4	2.1	2.0	2.1	2.1	2.1	2.1	2.4	3.0	3.0	2.8	2.5	2.3	2.4	2.3	2.2	2.0	2.0	2.2	2.4	2.5	2.6	2.7	2.7	2.6	2.6	2.4	2.4	2.5	2.8	3.1	3.2	3.4
2.0	2.0	1.8	1.8	1.7	1.6	1.7	1.7	1.7	1.6	2.0	2.1	1.8	1.4	1.4	1.5	1.6	1.4	1.3	1.3	1.3	1.3	1.3	1.2	1.7	1.6	1.2	.9	.7	.7	.7	.7	1.1	1.9	2.4	2.3
1.2	1.2	1.3	1.3	1.3	1.2	1.1	1.0	.8	.8	1.1	1.4	1.1	1.1	1.0	.8	.7	.7	.8	.7	.8	.8	.8	1.0	1.0	.8	.6	.5	.5	.5	.4	.4	.5	1.3	1.4	1.1

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

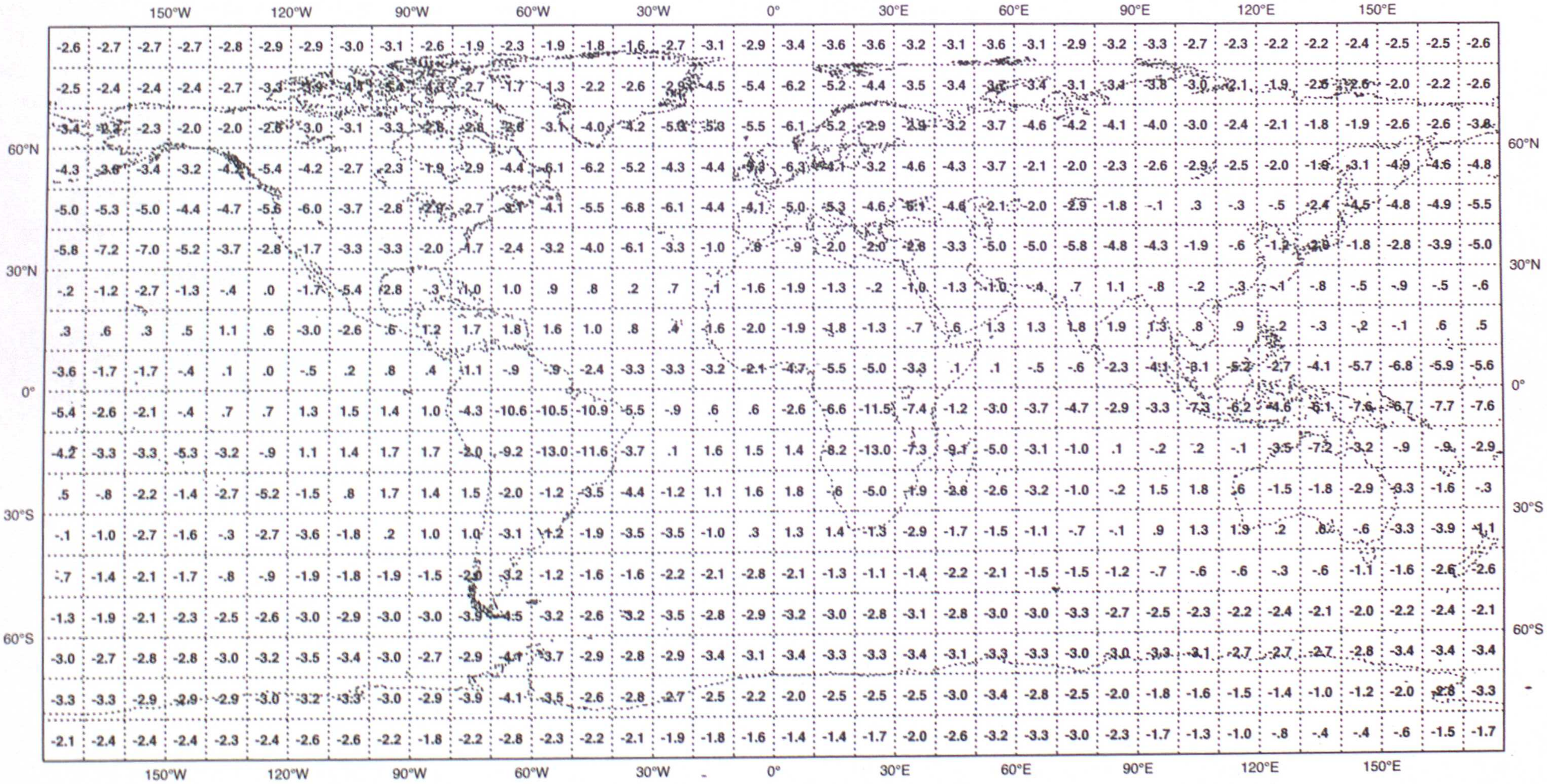
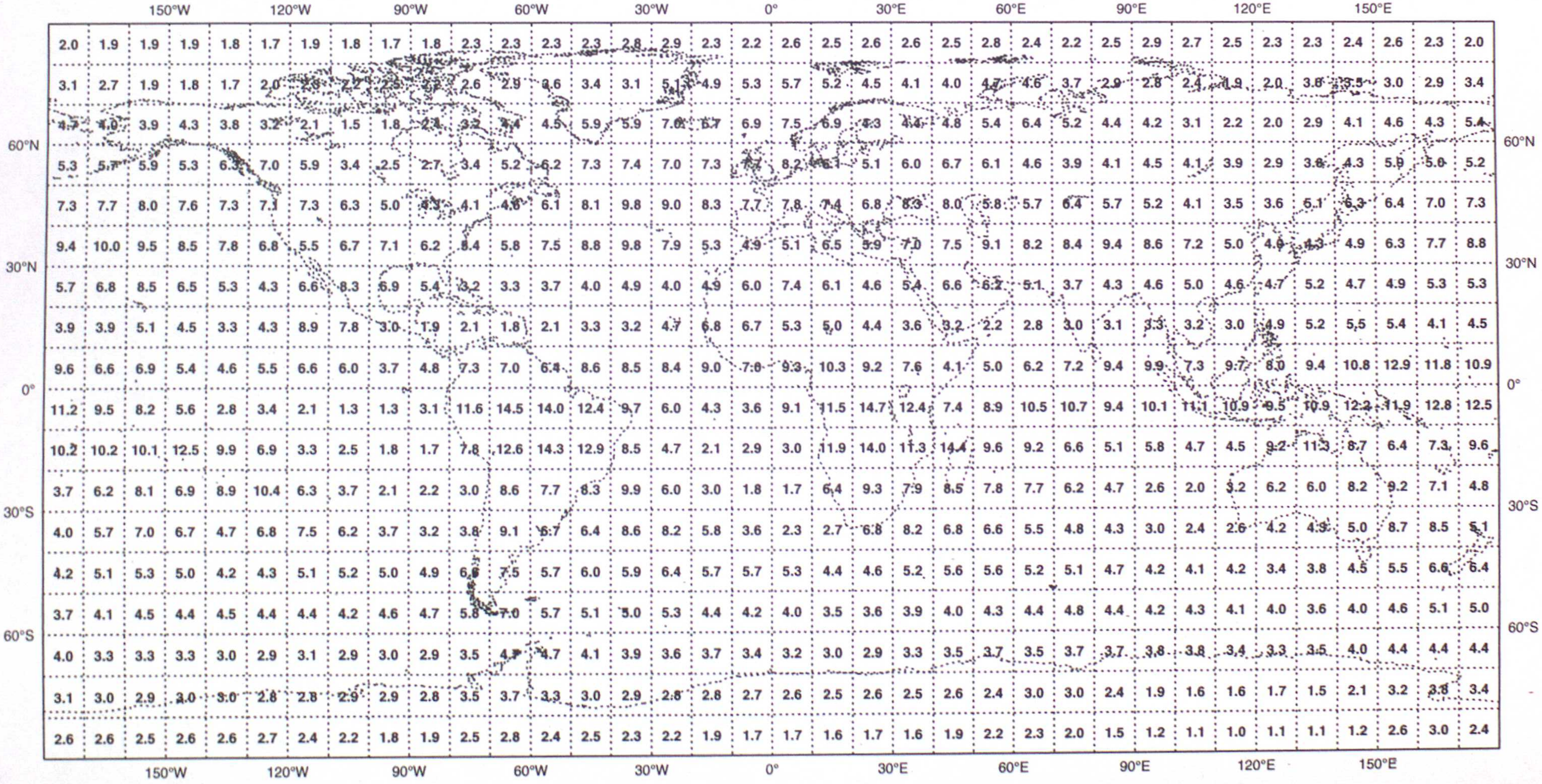
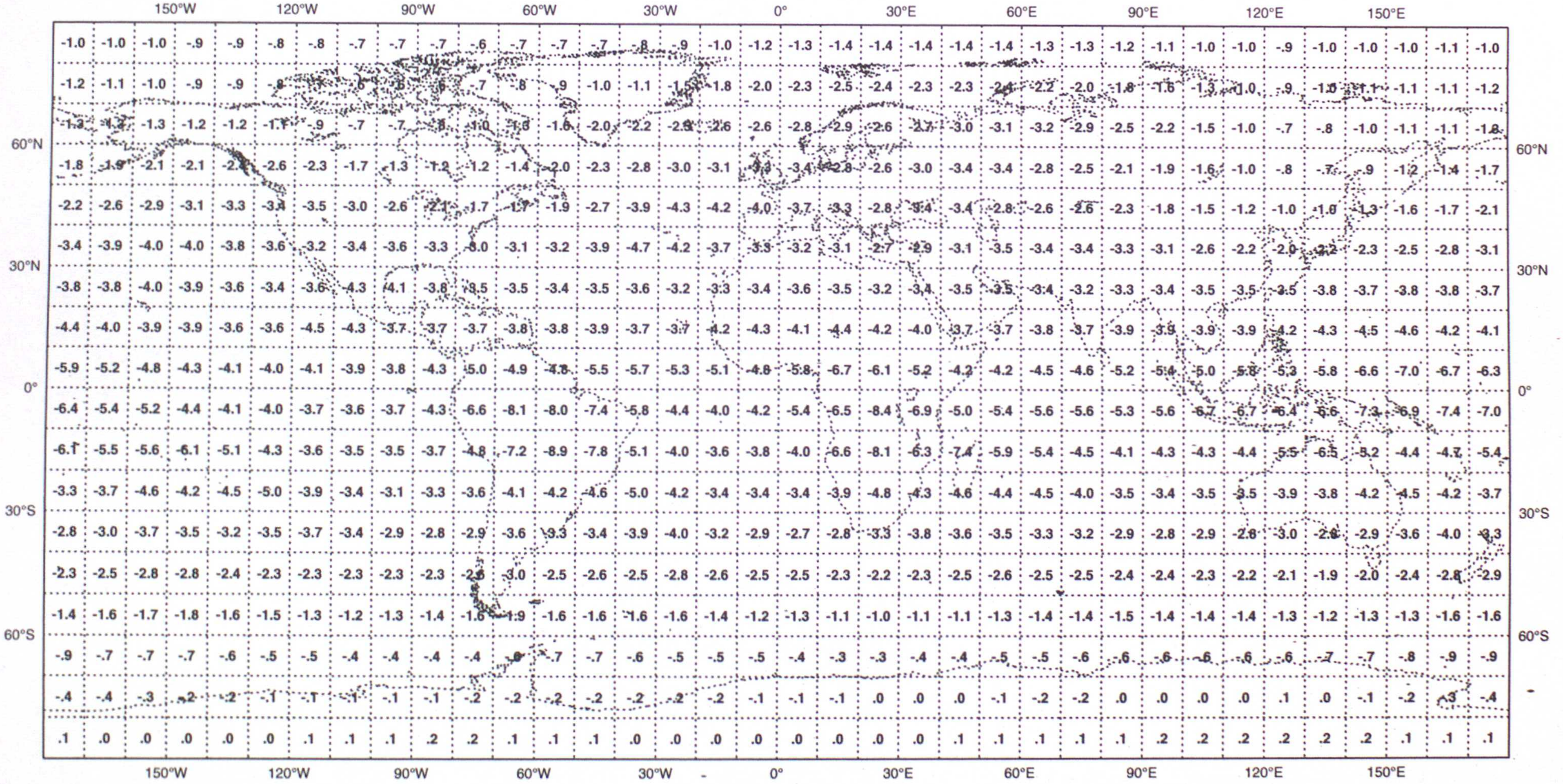

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-2.6 -2.7 -2.7 -2.7 -2.8 -2.9 -2.9 -3.0 -3.1 -2.6 -1.9 -2.3 -1.9 -1.8 -1.6 -2.7 -3.1 -2.9 -3.4 -3.6 -3.6 -3.2 -3.1 -3.6 -3.1 -2.9 -3.2 -3.3 -2.7 -2.3 -2.2 -2.2 -2.4 -2.5 -2.5 -2.6
-2.5 -2.4 -2.4 -2.4 -2.7 -3.3 -3.9 -4.1 -5.4 -4.8 -2.7 -1.7 -1.3 -2.2 -2.6 -2.9 -4.5 -5.4 -6.2 -5.2 -4.4 -3.5 -3.4 -3.7 -3.4 -3.1 -3.4 -3.8 -3.0 -2.1 -1.9 -2.5 -2.6 -2.0 -2.2 -2.6
-3.4 -3.7 -2.3 -2.0 -2.0 -2.8 -3.0 -3.1 -3.3 -2.8 -2.8 -2.6 -3.1 -4.0 -4.2 -5.0 -5.3 -5.5 -6.1 -5.2 -2.9 -2.9 -3.2 -3.7 -4.6 -4.2 -4.1 -4.0 -3.0 -2.4 -2.1 -1.8 -1.9 -2.6 -2.6 -3.8
-4.3 -3.8 -3.4 -3.2 -4.2 -5.4 -4.2 -2.7 -2.3 -1.9 -2.9 -4.4 -6.1 -6.2 -5.2 -4.3 -4.4 -9.3 -6.3 -4.1 -3.2 -4.6 -4.3 -3.7 -2.1 -2.0 -2.3 -2.6 -2.9 -2.5 -2.0 -1.9 -3.1 -4.9 -4.6 -4.8
-5.0 -5.3 -5.0 -4.4 -4.7 -5.6 -6.0 -3.7 -2.8 -2.8 -2.7 -3.1 -4.1 -5.5 -6.8 -6.1 -4.4 -4.1 -5.0 -5.3 -4.6 -6.1 -4.6 -2.1 -2.0 -2.9 -1.8 -.1 .3 -.3 -.5 -2.4 -4.5 -4.8 -4.9 -5.5
-5.8 -7.2 -7.0 -5.2 -3.7 -2.8 -1.7 -3.3 -3.3 -2.0 -1.7 -2.4 -3.2 -4.0 -6.1 -3.3 -1.0 -.8 -.9 -2.0 -2.0 -2.8 -3.3 -5.0 -5.0 -5.8 -4.8 -4.3 -1.9 -.6 -1.2 -2.0 -1.8 -2.8 -3.9 -5.0
-.2 -1.2 -2.7 -1.3 -.4 .0 -1.7 -5.4 2.8 -.3 1.0 1.0 .9 .8 .2 .7 -.1 -1.6 -1.9 -1.3 -.2 -1.0 -1.3 -1.0 -.4 .7 1.1 -.8 -.2 -.3 -.1 -.8 -.5 -.9 -.5 -.6
.3 .6 .3 .5 1.1 .6 -3.0 -2.6 .5 1.2 1.7 1.8 1.6 1.0 .8 .4 -1.6 -2.0 -1.9 -1.8 -1.3 -.7 .6 1.3 1.3 1.8 1.9 1.3 .8 .9 .2 -.3 -.2 -.1 .6 .5
-3.6 -1.7 -1.7 -.4 .1 .0 -.5 .2 .8 .4 1.1 -.9 -.9 -2.4 -3.3 -3.3 -3.2 -2.1 -4.7 -5.5 -5.0 -3.3 .1 .1 -.5 -.6 -2.3 -4.1 -3.1 -5.2 -2.7 -4.1 -5.7 -6.8 -5.9 -5.6
-5.4 -2.6 -2.1 -.4 .7 .7 1.3 1.5 1.4 1.0 -4.3 -10.6 -10.5 -10.9 -5.5 -.9 .6 .6 -2.6 -6.6 -11.5 -7.4 -1.2 -3.0 -3.7 -4.7 -2.9 -3.3 -7.3 -6.2 -4.6 -5.1 -7.6 -6.7 -7.7 -7.6
-4.2 -3.3 -3.3 -5.3 -3.2 -.9 1.1 1.4 1.7 1.7 2.0 -9.2 -13.0 -11.6 -3.7 .1 1.6 1.5 1.4 -8.2 -13.0 -7.3 -9.1 -5.0 -3.1 -1.0 .1 -.2 .2 -.1 -3.5 -7.2 -3.2 -.9 -.9 -2.9
.5 -.8 -2.2 -1.4 -2.7 -5.2 -1.5 .8 1.7 1.4 1.5 -2.0 -1.2 -3.5 -4.4 -1.2 1.1 1.6 1.8 .6 -5.0 -1.9 -2.8 -2.6 -3.2 -1.0 -.2 1.5 1.8 .6 -1.5 -1.8 -2.9 -3.3 -1.6 -.3
-.1 -1.0 -2.7 -1.6 -.3 -2.7 -3.6 -1.8 .2 1.0 1.0 -3.1 1.2 -1.9 -3.5 -3.5 -1.0 .3 1.3 1.4 -1.3 -2.9 -1.7 -1.5 -1.1 -.7 -.1 .9 1.3 1.9 .2 .6 -.6 -3.3 -3.9 -1.1
-.7 -1.4 -2.1 -1.7 -.8 -.9 -1.9 -1.8 -1.9 -1.5 -2.0 -3.2 -1.2 -1.6 -1.6 -2.2 -2.1 -2.8 -2.1 -1.3 -1.1 -1.4 -2.2 -2.1 -1.5 -1.5 -1.2 -.7 -.6 -.6 -.3 -.6 -1.1 -1.6 -2.6 -2.6
-1.3 -1.9 -2.1 -2.3 -2.5 -2.6 -3.0 -2.9 -3.0 -3.0 -3.9 -4.5 -3.2 -2.6 -3.2 -3.5 -2.8 -2.9 -3.2 -3.0 -2.8 -3.1 -2.8 -3.0 -3.0 -3.3 -2.7 -2.5 -2.3 -2.2 -2.4 -2.1 -2.0 -2.2 -2.4 -2.1
-3.0 -2.7 -2.8 -2.8 -3.0 -3.2 -3.5 -3.4 -3.0 -2.7 -2.9 -4.4 -3.7 -2.9 -2.8 -2.9 -3.4 -3.1 -3.4 -3.3 -3.3 -3.4 -3.1 -3.3 -3.3 -3.0 -3.0 -3.3 -3.1 -2.7 -2.7 -2.7 -2.8 -3.4 -3.4 -3.4
-3.3 -3.3 -2.9 -2.9 -2.9 -3.0 -3.2 -3.3 -3.0 -2.9 -3.9 -4.1 -3.5 -2.6 -2.8 -2.7 -2.5 -2.2 -2.0 -2.5 -2.5 -2.5 -3.0 -3.4 -2.8 -2.5 -2.0 -1.8 -1.6 -1.5 -1.4 -1.0 -1.2 -2.0 -2.8 -3.3
-2.1 -2.4 -2.4 -2.4 -2.3 -2.4 -2.6 -2.6 -2.2 -1.8 -2.2 -2.8 -2.3 -2.2 -2.1 -1.9 -1.8 -1.6 -1.4 -1.4 -1.7 -2.0 -2.6 -3.2 -3.3 -3.0 -2.3 -1.7 -1.3 -1.0 -.8 -.4 -.4 -.6 -1.5 -1.7
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



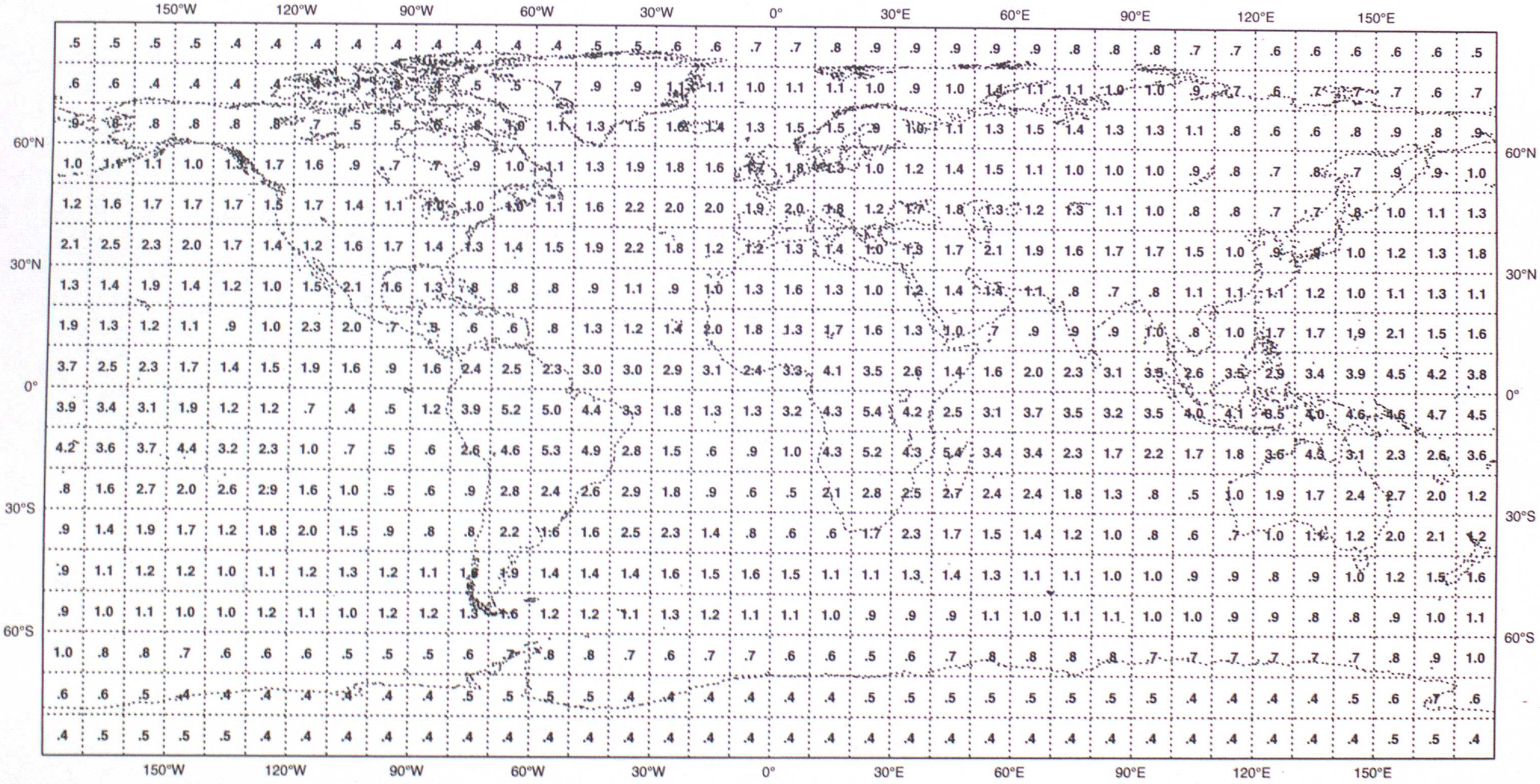
2.0	1.9	1.9	1.9	1.8	1.7	1.9	1.8	1.7	1.8	2.3	2.3	2.3	2.3	2.8	2.9	2.3	2.2	2.6	2.5	2.6	2.6	2.5	2.8	2.4	2.2	2.5	2.9	2.7	2.5	2.3	2.3	2.4	2.6	2.3	2.0
3.1	2.7	1.9	1.8	1.7	2.0	2.8	2.2	2.5	2.2	2.6	2.9	3.6	3.4	3.1	5.1	4.9	5.3	5.7	5.2	4.5	4.1	4.0	4.7	4.6	3.7	2.9	2.8	2.4	1.9	2.0	3.6	3.5	3.0	2.9	3.4
4.7	4.0	3.9	4.3	3.8	3.2	2.1	1.5	1.8	2.1	3.2	4.4	4.5	5.9	5.9	7.0	6.7	6.9	7.5	6.9	4.3	4.4	4.8	5.4	6.4	5.2	4.4	4.2	3.1	2.2	2.0	2.9	4.1	4.6	4.3	5.4
5.3	5.7	5.9	5.3	6.3	7.0	5.9	3.4	2.5	2.7	3.4	5.2	6.2	7.3	7.4	7.0	7.3	7.7	8.2	6.1	5.1	6.0	6.7	6.1	4.6	3.9	4.1	4.5	4.1	3.9	2.9	3.8	4.3	5.9	5.0	5.2
7.3	7.7	8.0	7.6	7.3	7.1	7.3	6.3	5.0	4.3	4.1	4.6	6.1	8.1	9.8	9.0	8.3	7.7	7.8	7.4	6.8	8.3	8.0	5.8	5.7	6.4	5.7	5.2	4.1	3.5	3.6	5.1	6.3	6.4	7.0	7.3
9.4	10.0	9.5	8.5	7.8	6.8	5.5	6.7	7.1	6.2	8.4	5.8	7.5	8.8	9.8	7.9	5.3	4.9	5.1	6.5	5.9	7.0	7.5	9.1	8.2	8.4	9.4	8.6	7.2	5.0	4.0	4.3	4.9	6.3	7.7	8.8
5.7	6.8	8.5	6.5	5.3	4.3	6.6	8.3	6.9	5.4	3.2	3.3	3.7	4.0	4.9	4.0	4.9	6.0	7.4	6.1	4.6	5.4	6.6	6.2	5.1	3.7	4.3	4.6	5.0	4.6	4.7	5.2	4.7	4.9	5.3	5.3
3.9	3.9	5.1	4.5	3.3	4.3	8.9	7.8	3.0	1.9	2.1	1.8	2.1	3.3	3.2	4.7	6.8	6.7	5.3	5.0	4.4	3.6	3.2	2.2	2.8	3.0	3.1	3.3	3.2	3.0	4.9	5.2	5.5	5.4	4.1	4.5
9.6	6.6	6.9	5.4	4.6	5.5	6.6	6.0	3.7	4.8	7.3	7.0	6.4	8.6	8.5	8.4	9.0	7.8	9.3	10.3	9.2	7.6	4.1	5.0	6.2	7.2	9.4	9.9	7.3	9.7	8.0	9.4	10.8	12.9	11.8	10.9
11.2	9.5	8.2	5.6	2.8	3.4	2.1	1.3	1.3	3.1	11.6	14.5	14.0	12.4	9.7	6.0	4.3	3.6	9.1	11.5	14.7	12.4	7.4	8.9	10.5	10.7	9.4	10.1	11.1	10.9	9.5	10.9	12.2	11.9	12.8	12.5
10.2	10.2	10.1	12.5	9.9	6.9	3.3	2.5	1.8	1.7	7.8	12.6	14.3	12.9	8.5	4.7	2.1	2.9	3.0	11.9	14.0	11.3	14.4	9.6	9.2	6.6	5.1	5.8	4.7	4.5	9.2	11.3	8.7	6.4	7.3	9.6
3.7	6.2	8.1	6.9	8.9	10.4	6.3	3.7	2.1	2.2	3.0	8.6	7.7	8.3	9.9	6.0	3.0	1.8	1.7	6.4	9.3	7.9	8.5	7.8	7.7	6.2	4.7	2.6	2.0	3.2	6.2	6.0	8.2	9.2	7.1	4.8
4.0	5.7	7.0	6.7	4.7	6.8	7.5	6.2	3.7	3.2	3.8	9.1	6.7	6.4	8.6	8.2	5.8	3.6	2.3	2.7	6.8	8.2	6.8	6.6	5.5	4.8	4.3	3.0	2.4	2.6	4.2	4.3	5.0	8.7	8.5	5.1
4.2	5.1	5.3	5.0	4.2	4.3	5.1	5.2	5.0	4.9	6.6	7.5	5.7	6.0	5.9	6.4	5.7	5.7	5.3	4.4	4.6	5.2	5.6	5.6	5.2	5.1	4.7	4.2	4.1	4.2	3.4	3.8	4.5	5.5	6.6	6.4
3.7	4.1	4.5	4.4	4.5	4.4	4.4	4.2	4.6	4.7	5.8	7.0	5.7	5.1	5.0	5.3	4.4	4.2	4.0	3.5	3.6	3.9	4.0	4.3	4.4	4.8	4.4	4.2	4.3	4.1	4.0	3.6	4.0	4.6	5.1	5.0
4.0	3.3	3.3	3.3	3.0	2.9	3.1	2.9	3.0	2.9	3.5	4.7	4.7	4.1	3.9	3.6	3.7	3.4	3.2	3.0	2.9	3.3	3.5	3.7	3.5	3.7	3.7	3.8	3.8	3.4	3.3	3.5	4.0	4.4	4.4	4.4
3.1	3.0	2.9	3.0	3.0	2.8	2.8	2.9	2.9	2.8	3.5	3.7	3.3	3.0	2.9	2.8	2.8	2.7	2.6	2.5	2.6	2.5	2.6	2.4	3.0	3.0	2.4	1.9	1.6	1.6	1.7	1.5	2.1	3.2	3.8	3.4
2.6	2.6	2.5	2.6	2.6	2.7	2.4	2.2	1.8	1.9	2.5	2.8	2.4	2.5	2.3	2.2	1.9	1.7	1.7	1.6	1.7	1.6	1.9	2.2	2.3	2.0	1.5	1.2	1.1	1.0	1.1	1.1	1.2	2.6	3.0	2.4

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



-1.0	-1.0	-1.0	-.9	-.9	-.8	-.8	-.7	-.7	-.7	-.6	-.7	-.7	-.7	-.8	-.9	-1.0	-1.2	-1.3	-1.4	-1.4	-1.4	-1.4	-1.4	-1.3	-1.3	-1.2	-1.1	-1.0	-1.0	-.9	-1.0	-1.0	-1.0	-1.1	-1.0
-1.2	-1.1	-1.0	-.9	-.9	-.8	[illegible]	-.6	-.6	-.6	-.7	-.8	-.9	-1.0	-1.1	-1.5	-1.8	-2.0	-2.3	-2.5	-2.4	-2.3	-2.3	-2.4	-2.2	-2.0	-1.8	-1.6	-1.3	-1.0	-.9	-1.0	-1.1	-1.1	-1.1	-1.2
-1.3	-1.2	-1.3	-1.2	-1.2	-1.1	-.9	-.7	-.7	-.8	-1.0	-1.3	-1.6	-2.0	-2.2	-2.8	-2.6	-2.6	-2.8	-2.9	-2.6	-2.7	-3.0	-3.1	-3.2	-2.9	-2.5	-2.2	-1.5	-1.0	-.7	-.8	-1.0	-1.1	-1.1	-1.8
-1.8	-1.9	-2.1	-2.1	-2.4	-2.6	-2.3	-1.7	-1.3	-1.2	-1.2	-1.4	-2.0	-2.3	-2.8	-3.0	-3.1	-3.3	-3.4	-2.8	-2.6	-3.0	-3.4	-3.4	-2.8	-2.5	-2.1	-1.9	-1.6	-1.0	-.8	-.7	-.9	-1.2	-1.4	-1.7
-2.2	-2.6	-2.9	-3.1	-3.3	-3.4	-3.5	-3.0	-2.6	-2.1	-1.7	-1.7	-1.9	-2.7	-3.9	-4.3	-4.2	-4.0	-3.7	-3.3	-2.8	-3.4	-3.4	-2.8	-2.6	-2.6	-2.3	-1.8	-1.5	-1.2	-1.0	-1.0	-1.3	-1.6	-1.7	-2.1
-3.4	-3.9	-4.0	-4.0	-3.8	-3.6	-3.2	-3.4	-3.6	-3.3	-3.0	-3.1	-3.2	-3.9	-4.7	-4.2	-3.7	-3.3	-3.2	-3.1	-2.7	-2.9	-3.1	-3.5	-3.4	-3.4	-3.3	-3.1	-2.6	-2.2	-2.0	-2.2	-2.3	-2.5	-2.8	-3.1
-3.8	-3.8	-4.0	-3.9	-3.6	-3.4	-3.6	-4.3	-4.1	-3.8	-3.5	-3.5	-3.4	-3.5	-3.6	-3.2	-3.3	-3.4	-3.6	-3.5	-3.2	-3.4	-3.5	-3.5	-3.4	-3.2	-3.3	-3.4	-3.5	-3.5	-3.5	-3.8	-3.7	-3.8	-3.8	-3.7
-4.4	-4.0	-3.9	-3.9	-3.6	-3.6	-4.5	-4.3	-3.7	-3.7	-3.7	-3.8	-3.8	-3.9	-3.7	-3.7	-4.2	-4.3	-4.1	-4.4	-4.2	-4.0	-3.7	-3.7	-3.8	-3.7	-3.9	-3.9	-3.9	-3.9	-4.2	-4.3	-4.5	-4.6	-4.2	-4.1
-5.9	-5.2	-4.8	-4.3	-4.1	-4.0	-4.1	-3.9	-3.8	-4.3	-5.0	-4.9	-4.8	-5.5	-5.7	-5.3	-5.1	-4.8	-5.8	-6.7	-6.1	-5.2	-4.2	-4.2	-4.5	-4.6	-5.2	-5.4	-5.0	-5.8	-5.3	-5.8	-6.6	-7.0	-6.7	-6.3
-6.4	-5.4	-5.2	-4.4	-4.1	-4.0	-3.7	-3.6	-3.7	-4.3	-6.6	-8.1	-8.0	-7.4	-5.8	-4.4	-4.0	-4.2	-5.4	-6.5	-8.4	-6.9	-5.0	-5.4	-5.6	-5.6	-5.3	-5.6	-6.7	-6.7	-6.4	-6.6	-7.3	-6.9	-7.4	-7.0
-6.1	-5.5	-5.6	-6.1	-5.1	-4.3	-3.6	-3.5	-3.5	-3.7	-4.8	-7.2	-8.9	-7.8	-5.1	-4.0	-3.6	-3.8	-4.0	-6.6	-8.1	-6.3	-7.4	-5.9	-5.4	-4.5	-4.1	-4.3	-4.3	-4.4	-5.5	-6.5	-5.2	-4.4	-4.7	-5.4
-3.3	-3.7	-4.6	-4.2	-4.5	-5.0	-3.9	-3.4	-3.1	-3.3	-3.6	-4.1	-4.2	-4.6	-5.0	-4.2	-3.4	-3.4	-3.4	-3.9	-4.8	-4.3	-4.6	-4.4	-4.5	-4.0	-3.5	-3.4	-3.5	-3.5	-3.9	-3.8	-4.2	-4.5	-4.2	-3.7
-2.8	-3.0	-3.7	-3.5	-3.2	-3.5	-3.7	-3.4	-2.9	-2.8	-2.9	-3.6	-3.3	-3.4	-3.9	-4.0	-3.2	-2.9	-2.7	-2.8	-3.3	-3.8	-3.6	-3.5	-3.3	-3.2	-2.9	-2.8	-2.9	-2.8	-3.0	-2.8	-2.9	-3.6	-4.0	-3.3
-2.3	-2.5	-2.8	-2.8	-2.4	-2.3	-2.3	-2.3	-2.3	-2.3	-2.5	-3.0	-2.5	-2.6	-2.5	-2.8	-2.6	-2.5	-2.5	-2.3	-2.2	-2.3	-2.5	-2.6	-2.5	-2.5	-2.4	-2.4	-2.3	-2.2	-2.1	-1.9	-2.0	-2.4	-2.8	-2.9
-1.4	-1.6	-1.7	-1.8	-1.6	-1.5	-1.3	-1.2	-1.3	-1.4	-1.6	-1.9	-1.6	-1.6	-1.6	-1.6	-1.4	-1.2	-1.3	-1.1	-1.0	-1.1	-1.1	-1.3	-1.4	-1.4	-1.5	-1.4	-1.4	-1.4	-1.3	-1.2	-1.3	-1.3	-1.6	-1.6
-.9	-.7	-.7	-.7	-.6	-.5	-.5	-.4	-.4	-.4	-.4	-.6	-.7	-.7	-.6	-.5	-.5	-.5	-.4	-.3	-.3	-.4	-.4	-.5	-.5	-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.7	-.8	-.9	-.9
-.4	-.4	-.3	-.2	-.2	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.1	-.1	-.1	.0	.0	.0	-.1	-.2	-.2	.0	.0	.0	.0	.1	.0	-.1	-.2	-.3	-.4
.1	.0	.0	.0	.0	.0	.1	.1	.1	.2	.2	.1	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.2	.2	.2	.2	.2	.2	.1	.1	.1

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.6	.6	.7	.7	.8	.9	.9	.9	.9	.9	.8	.8	.8	.7	.7	.6	.6	.6	.6	.6	.5
.6	.6	.4	.4	.4	.4	.4	.4	.3	.4	.5	.5	.7	.9	.9	1.1	1.1	1.0	1.1	1.1	1.0	.9	1.0	1.4	1.1	1.1	1.0	1.0	.9	.7	.6	.7	.7	.7	.6	.7
.9	.8	.8	.8	.8	.8	.7	.5	.5	.6	.6	1.0	1.1	1.3	1.5	1.6	1.4	1.3	1.5	1.5	.9	1.0	1.1	1.3	1.5	1.4	1.3	1.3	1.1	.8	.6	.6	.8	.9	.8	.9
1.0	1.1	1.1	1.0	1.3	1.7	1.6	.9	.7	.7	.9	1.0	1.1	1.3	1.9	1.8	1.6	1.7	1.8	1.3	1.0	1.2	1.4	1.5	1.1	1.0	1.0	1.0	.9	.8	.7	.8	.7	.9	.9	1.0
1.2	1.6	1.7	1.7	1.7	1.5	1.7	1.4	1.1	1.0	1.0	1.0	1.1	1.6	2.2	2.0	2.0	1.9	2.0	1.8	1.2	1.7	1.8	1.3	1.2	1.3	1.1	1.0	.8	.8	.7	.7	.8	1.0	1.1	1.3
2.1	2.5	2.3	2.0	1.7	1.4	1.2	1.6	1.7	1.4	1.3	1.4	1.5	1.9	2.2	1.8	1.2	1.2	1.3	1.4	1.0	1.3	1.7	2.1	1.9	1.6	1.7	1.7	1.5	1.0	.9	.9	1.0	1.2	1.3	1.8
1.3	1.4	1.9	1.4	1.2	1.0	1.5	2.1	1.6	1.3	.8	.8	.8	.9	1.1	.9	1.0	1.3	1.6	1.3	1.0	1.2	1.4	1.4	1.1	.8	.7	.8	1.1	1.1	1.1	1.2	1.0	1.1	1.3	1.1
1.9	1.3	1.2	1.1	.9	1.0	2.3	2.0	.7	.5	.6	.6	.8	1.3	1.2	1.4	2.0	1.8	1.3	1.7	1.6	1.3	1.0	.7	.9	.9	.9	1.0	.8	1.0	1.7	1.7	1.9	2.1	1.5	1.6
3.7	2.5	2.3	1.7	1.4	1.5	1.9	1.6	.9	1.6	2.4	2.5	2.3	3.0	3.0	2.9	3.1	2.4	3.3	4.1	3.5	2.6	1.4	1.6	2.0	2.3	3.1	3.5	2.6	3.5	2.9	3.4	3.9	4.5	4.2	3.8
3.9	3.4	3.1	1.9	1.2	1.2	.7	.4	.5	1.2	3.9	5.2	5.0	4.4	3.3	1.8	1.3	1.3	3.2	4.3	5.4	4.2	2.5	3.1	3.7	3.5	3.2	3.5	4.0	4.1	6.5	4.0	4.6	4.6	4.7	4.5
4.2	3.6	3.7	4.4	3.2	2.3	1.0	.7	.5	.6	2.6	4.6	5.3	4.9	2.8	1.5	.6	.9	1.0	4.3	5.2	4.3	5.4	3.4	3.4	2.3	1.7	2.2	1.7	1.8	3.6	4.3	3.1	2.3	2.6	3.6
.8	1.6	2.7	2.0	2.6	2.9	1.6	1.0	.5	.6	.9	2.8	2.4	2.6	2.9	1.8	.9	.6	.5	2.1	2.8	2.5	2.7	2.4	2.4	1.8	1.3	.8	.5	1.0	1.9	1.7	2.4	2.7	2.0	1.2
.9	1.4	1.9	1.7	1.2	1.8	2.0	1.5	.9	.8	.8	2.2	1.6	1.6	2.5	2.3	1.4	.8	.6	.6	1.7	2.3	1.7	1.5	1.4	1.2	1.0	.8	.6	.7	1.0	1.1	1.2	2.0	2.1	1.2
.9	1.1	1.2	1.2	1.0	1.1	1.2	1.3	1.2	1.1	1.6	1.9	1.4	1.4	1.4	1.6	1.5	1.6	1.5	1.1	1.1	1.3	1.4	1.3	1.1	1.1	1.0	1.0	.9	.9	.8	.9	1.0	1.2	1.5	1.6
.9	1.0	1.1	1.0	1.0	1.2	1.1	1.0	1.2	1.2	1.3	1.6	1.2	1.2	1.1	1.3	1.2	1.1	1.1	1.0	.9	.9	.9	1.1	1.0	1.1	1.1	1.0	1.0	.9	.9	.8	.8	.9	1.0	1.1
1.0	.8	.8	.7	.6	.6	.6	.5	.5	.5	.6	.7	.8	.8	.7	.6	.7	.7	.6	.6	.5	.6	.7	.8	.8	.8	.8	.8	.7	.7	.7	.7	.7	.7	.8	.9	1.0
.6	.6	.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.5	.6	.7	.6
.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

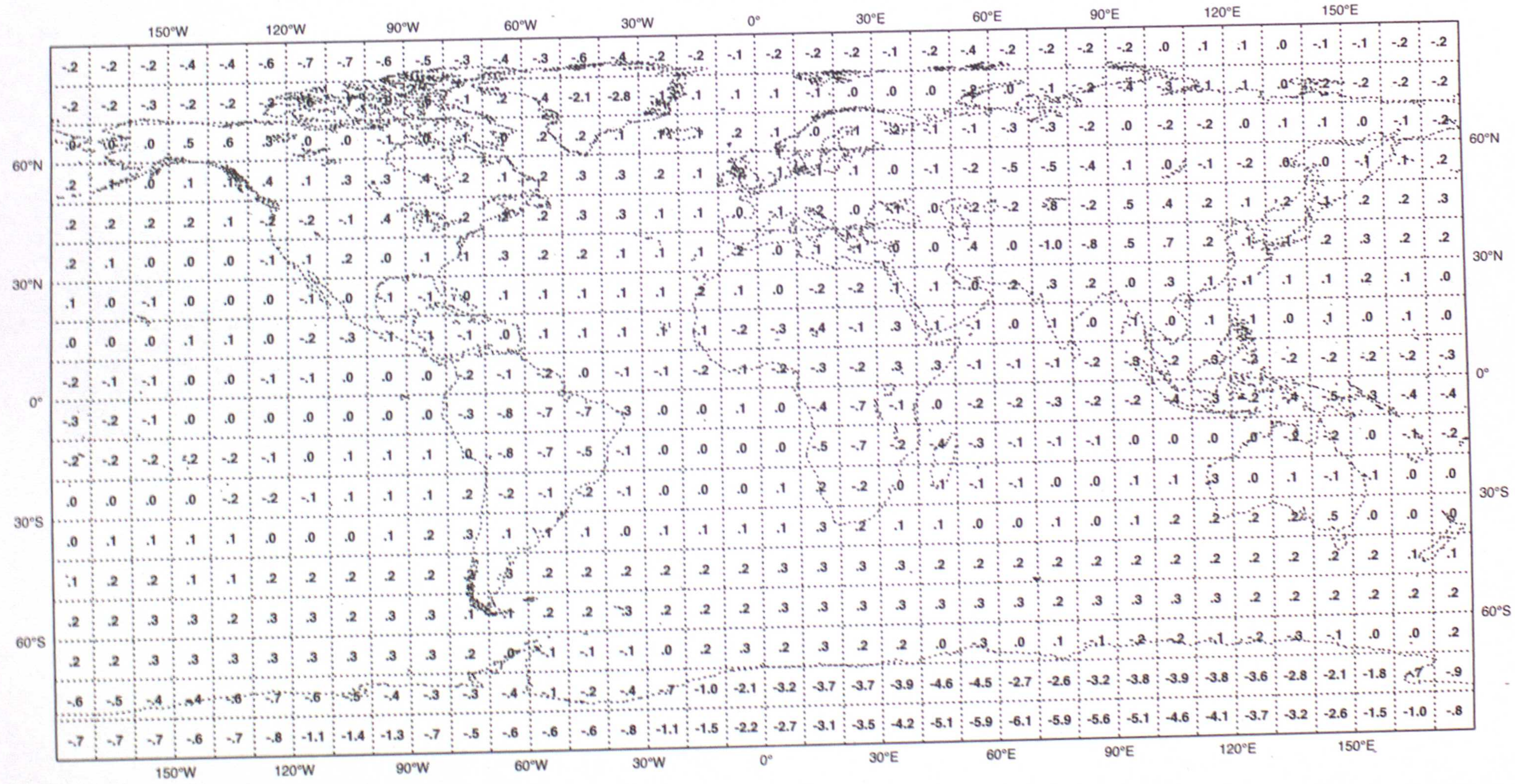

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

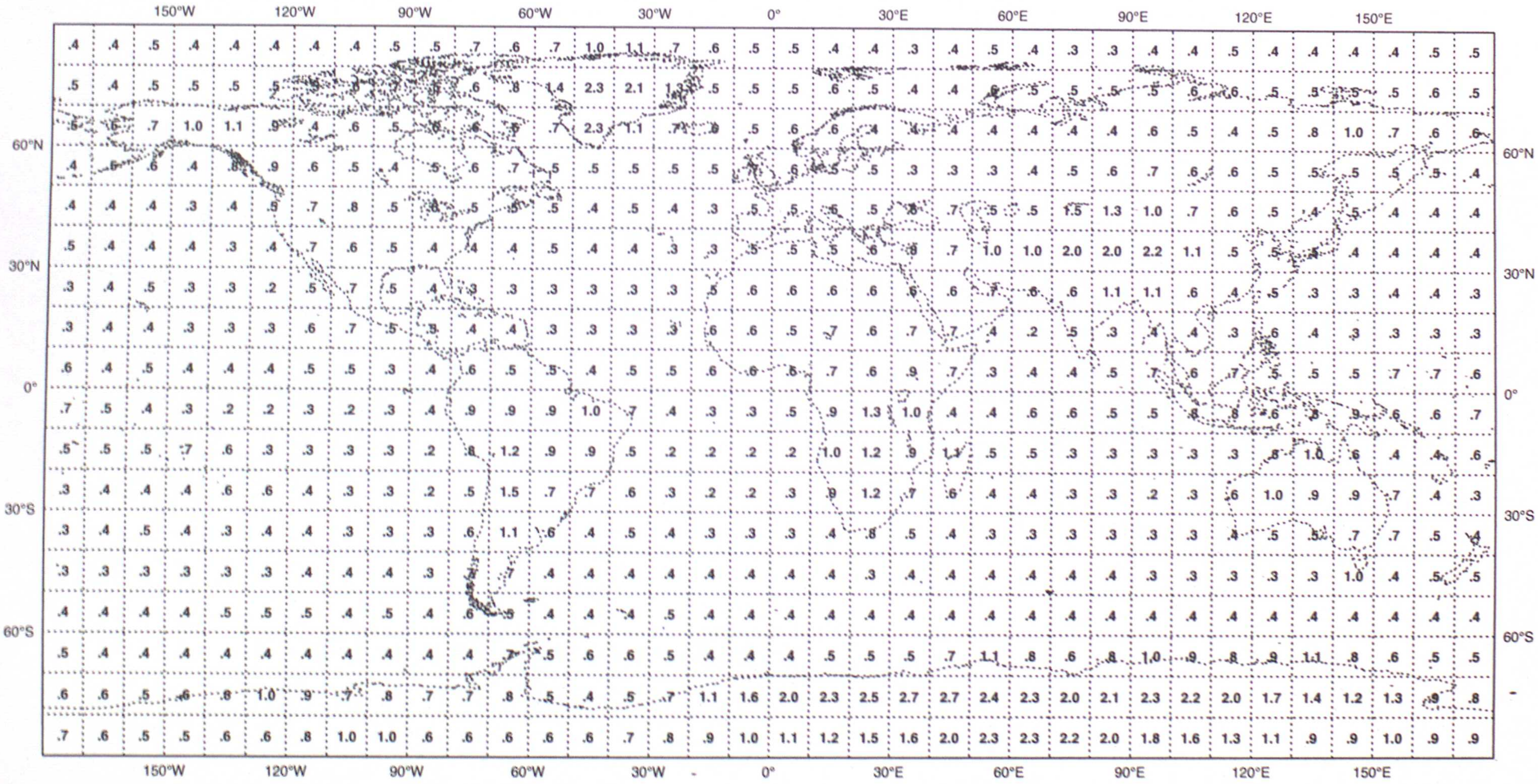

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

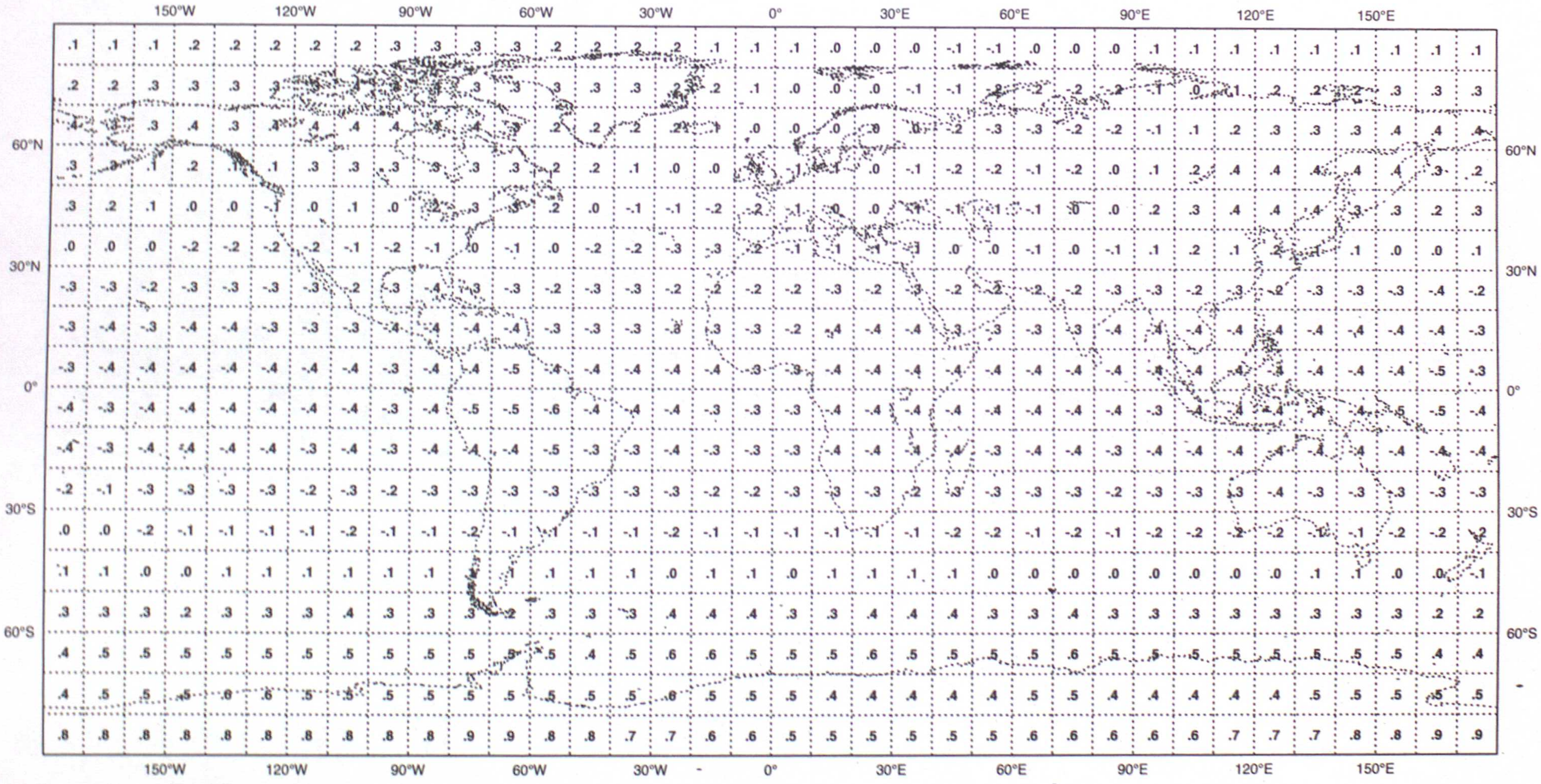

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.1 .1 .1 .2 .2 .2 .2 .2 .3 .3 .3 .3 .2 .2 .2 .2 .1 .1 .1 .0 .0 .0 -.1 -.1 .0 .0 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1
.2 .2 .3 .3 .3 .3 .3 .4 .3 .4 .3 .3 .3 .3 .3 .2 .2 .1 .0 .0 .0 -.1 -.1 -.2 -.2 -.2 -.2 -.1 .0 .1 .2 .2 .2 .3 .3 .3
.4 .3 .3 .4 .3 .4 .4 .4 .4 .4 .4 .3 .2 .2 .2 .2 .1 .0 .0 .0 .0 .0 -.2 -.3 -.3 -.2 -.2 -.1 .1 .2 .3 .3 .3 .4 .4 .4
.3 .3 .1 .2 .1 .1 .3 .3 .3 .3 .3 .3 .2 .2 .1 .0 .0 -.1 -.1 .0 -.1 -.2 -.2 -.1 -.2 .0 .1 .2 .4 .4 .4 .4 .4 .3 .2
.3 .2 .1 .0 .0 -.1 .0 .1 .0 .2 .3 .3 .2 .0 -.1 -.1 -.2 -.2 -.1 .0 .0 -.1 -.1 -.1 -.1 .0 .0 .2 .3 .4 .4 .4 .3 .3 .2 .3
.0 .0 .0 -.2 -.2 -.2 -.2 -.1 -.2 -.1 .0 -.1 .0 -.2 -.2 -.3 -.3 -.2 -.1 -.1 -.1 -.1 .0 .0 -.1 .0 -.1 .1 .2 .1 .2 -.1 .1 .0 .0 .1
-.3 -.3 -.2 -.3 -.3 -.3 -.3 -.2 -.3 -.4 -.3 -.3 -.2 -.3 -.3 -.2 -.2 -.2 -.2 -.3 -.2 -.3 -.2 -.2 -.2 -.2 -.3 -.3 -.2 -.3 -.2 -.3 -.3 -.3 -.4 -.2
-.3 -.4 -.3 -.4 -.4 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.3 -.3 -.2 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.3
-.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.3 -.4 -.4 -.5 -.4 -.4 -.4 -.4 -.4 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.5 -.3
-.4 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.3 -.4 -.5 -.5 -.6 -.4 -.4 -.4 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.3 -.4 -.4 -.4 -.4 -.4 -.5 -.5 -.4
-.4 -.3 -.4 -.4 -.4 -.4 -.3 -.4 -.3 -.4 -.4 -.4 -.5 -.3 -.3 -.4 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.3 -.4 -.4 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4
-.2 -.1 -.3 -.3 -.3 -.3 -.2 -.3 -.2 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.2 -.2 -.3 -.3 -.3 -.2 -.3 -.3 -.3 -.3 -.2 -.3 -.3 -.3 -.4 -.3 -.3 -.3 -.3 -.3
.0 .0 -.2 -.1 -.1 -.1 -.1 -.2 -.1 -.1 -.2 -.1 -.1 -.1 -.1 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.1 -.2 -.1 -.2 -.2 -.2 -.2 -.1 -.1 -.2 -.2 -.2
.1 .1 .0 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1 .1 .0 .1 .1 .1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .1 .1 .0 .0 -.1
.3 .3 .3 .2 .3 .3 .3 .4 .3 .3 .3 .2 .3 .3 .3 .4 .4 .4 .3 .3 .4 .4 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2
.4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .6 .6 .5 .5 .5 .6 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4
.4 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5
.8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .9 .9 .8 .8 .7 .7 .6 .6 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .7 .7 .7 .8 .8 .9 .9

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

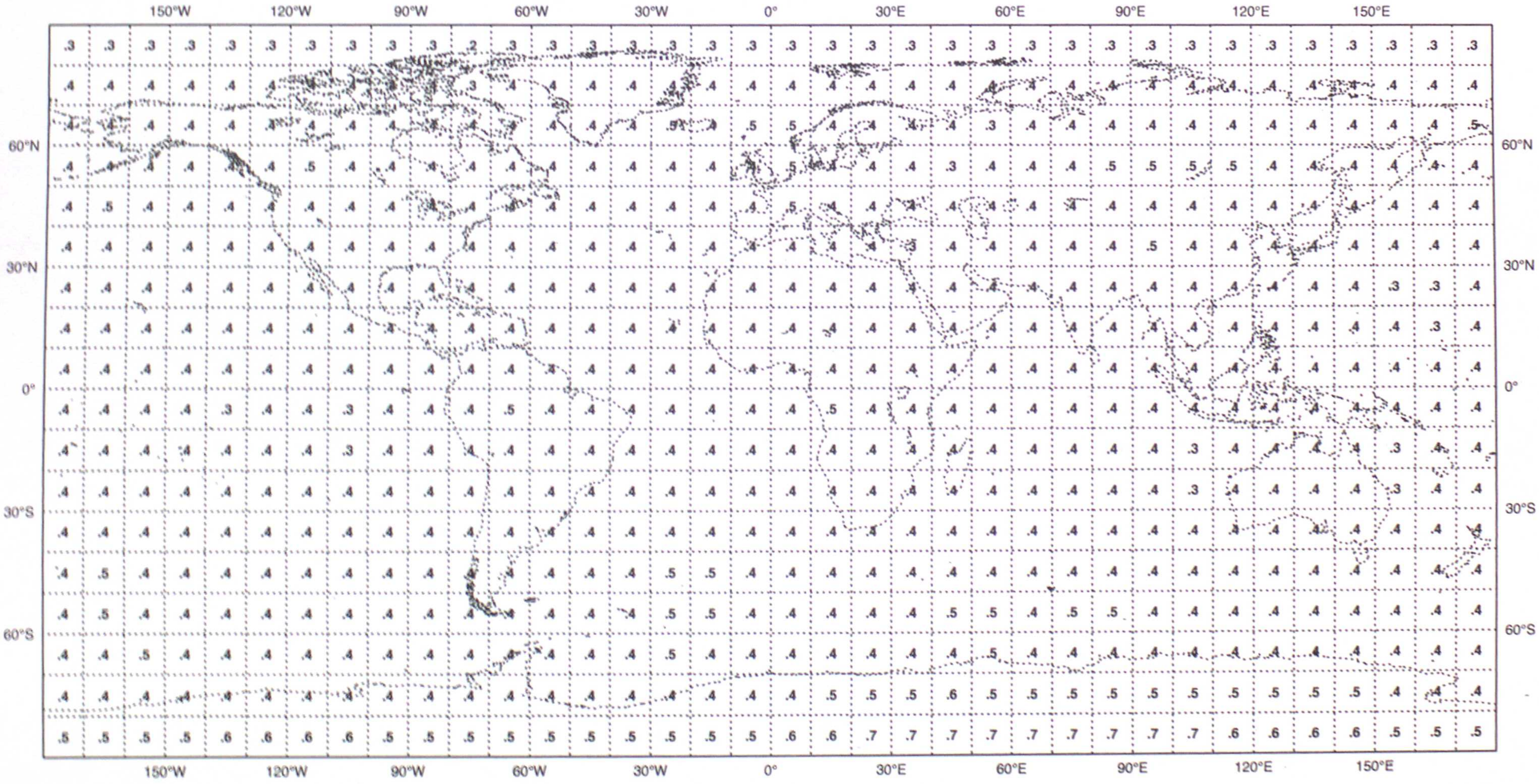

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

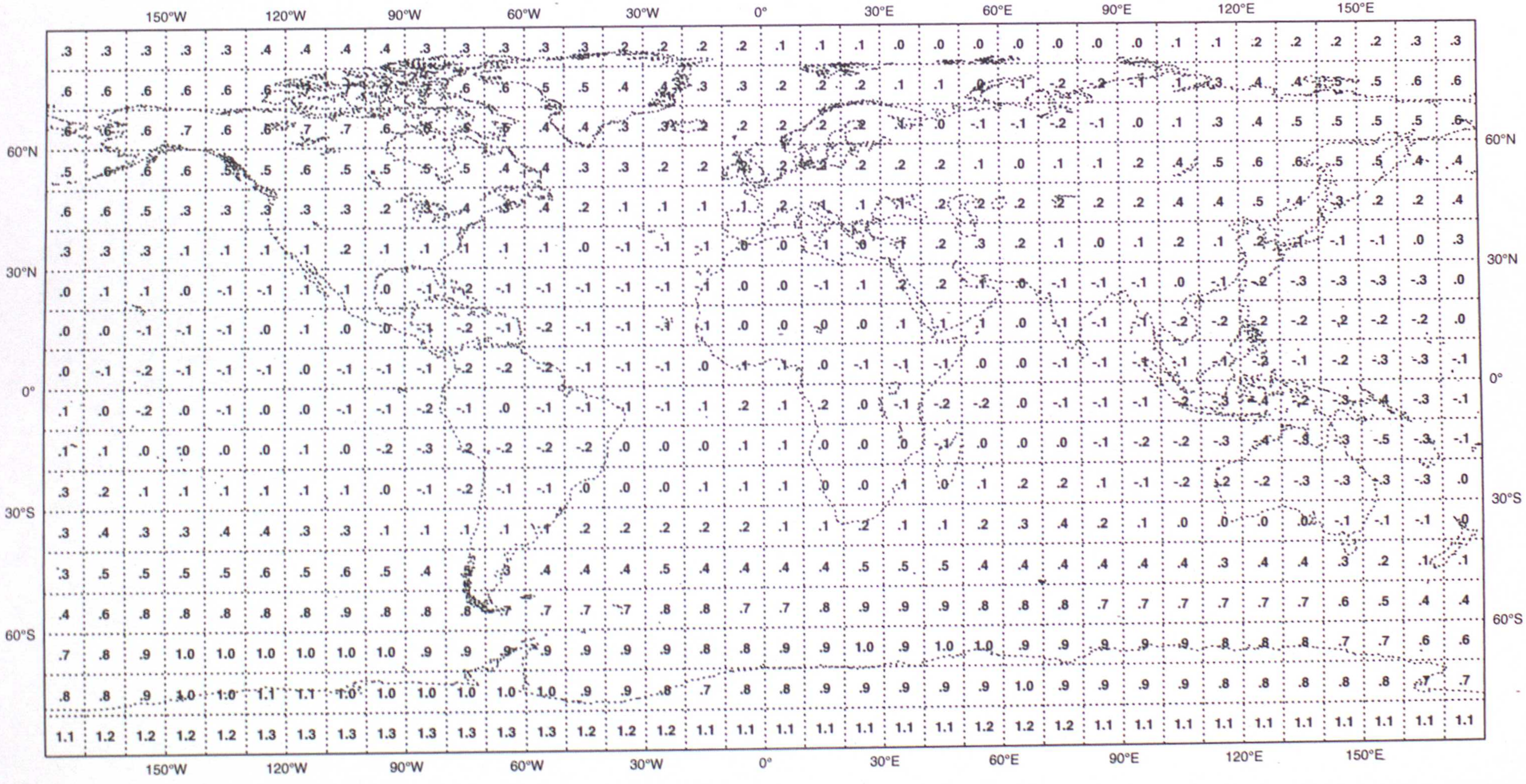

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

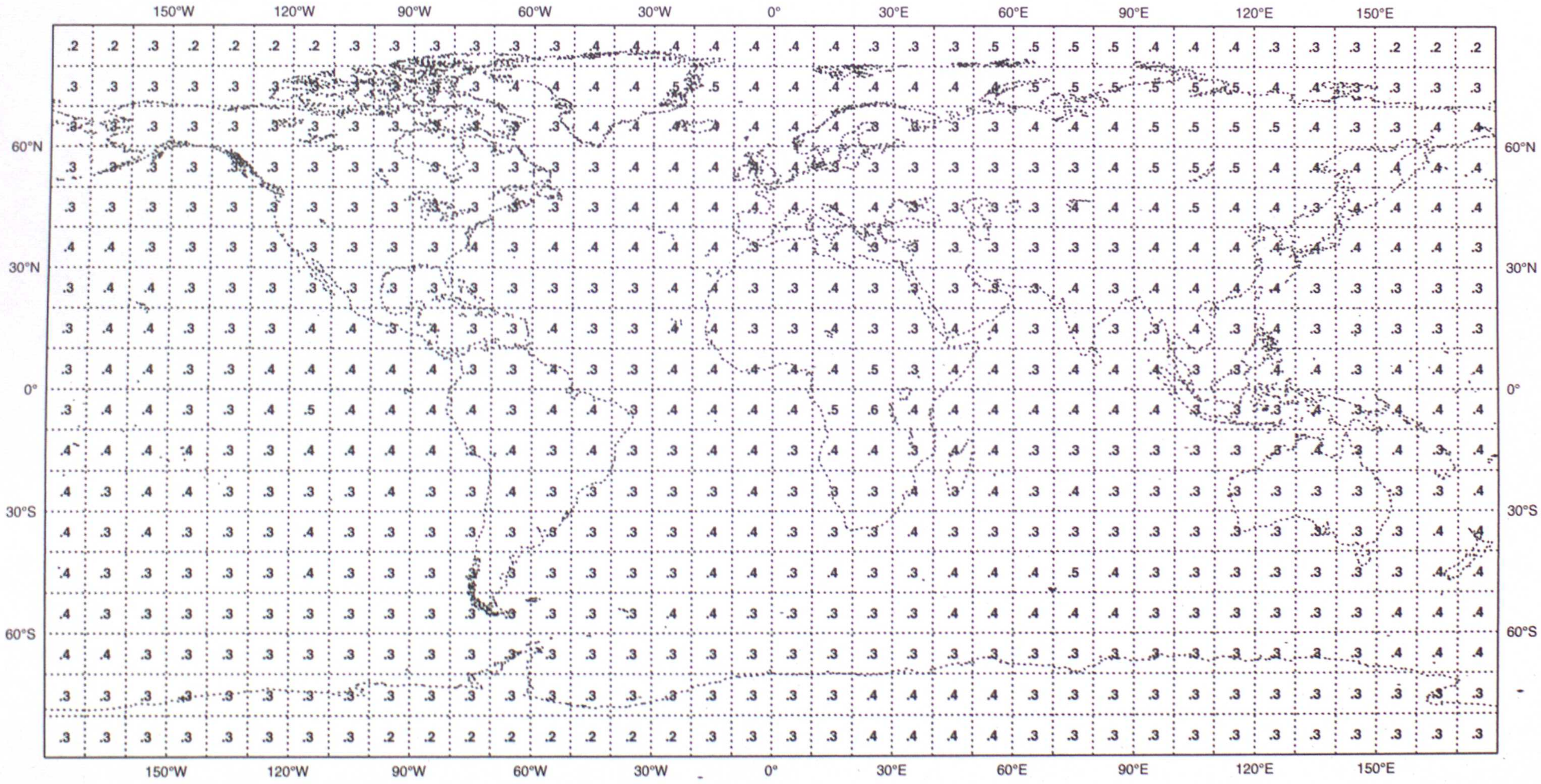

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13531	24.7	-22.8	P	741	0	1	0.5	0.1	0.5
13532	31.2	-12.9	P	741	0	1	0.5	0.0	0.5
13533	21.1	-27.6	P	747	0	1	0.5	0.2	0.6
13600	20.0	-34.0	P	590	0	21	0.6	0.8	1.0
13602	18.8	-36.9	P	430	0	0	0.6	0.2	0.6
13624	13.0	-17.9	P	99	0	0	0.8	0.1	0.8
13625	14.9	-17.1	P	226	0	0	0.6	-0.2	0.6
41504	16.8	-72.1	P	1132	0	69	0.6	1.6	1.7
41520	10.2	-45.3	P	1073	0	68	0.5	1.5	1.6
41532	24.0	-66.1	P	267	0	0	1.1	-0.2	1.2
41534	26.4	-62.6	P	643	0	16	0.5	-0.4	0.6
41590	20.7	-63.3	P	542	0	0	0.4	0.9	1.0
41594	25.9	-42.1	P	597	0	0	0.6	-0.2	0.7
41595	27.1	-40.3	P	551	0	0	0.6	0.8	1.0
41600	36.8	-66.4	P	611	0	3	1.9	0.0	1.9
41630	27.2	-71.0	P	554	0	13	0.7	0.8	1.1
41631	31.0	-76.0	P	469	0	1	0.8	0.1	0.8
41646	21.4	-74.1	P	500	0	0	0.5	0.2	0.5
41647	19.3	-83.7	P	490	0	0	0.6	0.3	0.6
41655	22.3	-69.6	P	506	0	0	0.4	0.6	0.8
41666	30.1	-54.3	P	591	0	0	0.6	0.6	0.8
41907	28.3	-61.9	P	303	0	0	0.6	-0.7	1.0
41910	23.9	-71.7	P	305	0	0	0.5	-0.1	0.5
41911	26.9	-63.5	P	318	0	0	0.5	-0.3	0.6
41913	23.1	-59.6	P	315	0	0	0.5	-0.7	0.8
41914	25.3	-60.7	P	116	0	0	0.5	0.3	0.6
41916	28.8	-62.6	P	325	0	0	0.6	0.0	0.6
41917	21.8	-69.5	P	285	0	0	0.4	-0.1	0.5
44546	49.8	-31.2	P	625	0	1	1.0	-0.2	1.0
44551	53.7	-26.2	P	732	0	2	1.1	0.9	1.4
44603	61.9	-20.8	P	1382	0	48	1.1	0.1	1.1
44605	50.3	-23.1	P	751	0	2	1.1	0.0	1.1
44606	31.5	-65.4	P	1190	0	41	0.5	-0.3	0.6
44608	35.3	-34.1	P	853	0	20	0.7	0.0	0.7
44609	58.3	-9.2	P	1106	0	39	1.1	-0.1	1.1
44611	62.7	-13.5	P	716	0	3	0.9	-0.1	0.9
44612	52.0	-35.6	P	645	0	1	1.1	-0.1	1.1
44613	56.8	-24.2	P	676	0	1	0.9	-0.5	1.0
44614	59.7	-30.8	P	701	0	4	1.1	-0.2	1.2
44616	53.0	-41.8	P	659	1	11	2.6	1.8	3.2
44617	52.6	-49.9	P	645	0	1	1.3	0.5	1.4
44621	60.1	-51.0	P	685	0	0	0.9	-0.2	0.9
44623	28.7	-41.4	P	712	0	2	0.8	0.0	0.8
44624	53.0	-50.1	P	666	0	0	1.3	0.6	1.5
44626	41.1	-65.4	P	727	0	5	1.5	0.2	1.5
44628	35.8	-31.2	P	726	0	6	0.8	-0.2	0.9
44630	33.8	-37.7	P	688	0	3	1.0	1.0	1.4
44742	42.6	-51.7	P	684	0	10	1.3	0.7	1.5
44743	51.4	-40.7	P	650	0	1	1.2	-0.1	1.2
44744	47.5	-34.9	P	1227	0	44	1.5	0.8	1.7
44745	51.5	-34.2	P	847	0	13	1.1	0.2	1.1
44747	48.5	-31.5	P	596	0	2	1.0	-0.6	1.1
44761	53.8	-44.5	P	670	0	2	1.3	0.4	1.4
44762	53.6	-38.0	P	286	0	2	1.6	1.5	2.2
44765	41.8	-61.5	P	610	0	0	0.8	-0.5	0.9
44766	47.5	-32.5	P	614	0	1	1.1	-0.1	1.1
44768	57.7	-45.6	P	698	2	32	2.9	2.9	4.1
44770	55.2	-16.3	P	140	0	23	1.1	-0.6	1.3
44771	47.2	-24.0	P	269	0	26	1.0	-0.5	1.1
44772	55.4	-43.0	P	457	0	37	2.8	-0.6	2.8

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
44773	58.6	-34.0	P	340	0	26	1.2	-0.2	1.3
44777	32.4	-20.4	P	227	0	16	1.0	0.1	1.1
44778	39.0	-23.0	P	292	0	20	0.7	0.2	0.7
44780	56.6	-29.6	P	543	1	36	1.0	-0.1	1.0
62513	30.7	-17.8	P	749	0	3	0.5	0.6	0.8
62514	32.7	-26.0	P	744	0	1	0.8	0.4	0.9
62515	22.1	-59.6	P	740	0	1	0.4	0.0	0.5
62517	28.3	-32.0	P	747	0	2	0.5	-0.5	0.7
62519	45.2	-2.4	P	349	0	5	0.6	0.0	0.6
62551	38.5	-23.6	P	1061	0	34	0.7	0.3	0.8
62552	34.1	-21.1	P	743	0	1	0.6	0.7	1.0
62574	47.8	-8.1	P	576	1	2	0.9	0.7	1.1
62598	58.4	-8.1	P	445	1	37	1.1	0.0	1.1
62711	51.9	-31.6	P	198	1	7	1.5	0.7	1.7
62712	58.0	-21.0	P	717	0	7	0.8	0.2	0.8
62801	37.6	-19.9	P	676	0	2	0.6	0.5	0.8
62804	46.2	-7.4	P	685	0	2	1.2	-0.2	1.2
64523	66.6	-22.9	P	1204	1	47	3.0	0.8	3.1
65597	57.9	-48.4	P	557	0	38	1.5	-1.0	1.8
65598	57.8	-42.8	P	380	0	29	1.8	-0.8	1.9
65599	60.2	-39.6	P	258	0	27	1.2	-0.4	1.3

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	20.0	-34.0	SPEED	585	0	100	1.2	-0.8	1.5
13602	18.8	-36.9	SPEED	426	0	100	1.1	-0.9	1.4
41532	24.0	-66.1	SPEED	229	0	100	1.4	0.2	1.4
41590	20.7	-63.3	SPEED	530	0	100	1.6	-0.6	1.7
41594	25.9	-42.1	SPEED	582	0	100	1.3	-0.6	1.5
41595	27.1	-40.3	SPEED	541	0	100	1.4	-0.9	1.7
41647	19.3	-83.7	SPEED	451	0	100	2.7	1.0	2.9
41655	22.3	-69.6	SPEED	50	0	100	4.7	6.6	8.1
44546	49.8	-31.2	SPEED	622	0	100	3.8	-0.6	3.9
44551	53.7	-26.2	SPEED	690	0	100	2.6	0.4	2.6
62574	47.8	-8.1	SPEED	556	0	100	1.5	-1.3	2.0

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	20.0	-34.0	DIRN.	369	0	0	12.1	-3.5	12.7
13602	18.8	-36.9	DIRN.	297	0	0	11.8	-11.7	16.6
41532	24.0	-66.1	DIRN.	177	1	0	33.4	-11.7	35.4
41590	20.7	-63.3	DIRN.	200	0	0	15.5	0.5	15.5
41594	25.9	-42.1	DIRN.	249	0	0	18.0	-8.5	19.9
41595	27.1	-40.3	DIRN.	191	0	0	23.6	-34.0	41.4
41647	19.3	-83.7	DIRN.	338	0	0	16.2	2.2	16.4
41655	22.3	-69.6	DIRN.	50	0	0	10.9	-4.5	11.8
44546	49.8	-31.2	DIRN.	547	0	0	16.9	17.1	24.0
44551	53.7	-26.2	DIRN.	612	0	0	21.4	-0.3	21.4
62574	47.8	-8.1	DIRN.	455	0	0	16.9	2.4	17.1

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	372	1	9	2.0	0.3	309	0	6	0	7.5	1.5
ACA	579	1	5	1.7	-0.4	583	1	5	0	7.2	0.9
AEA	187	1	5	1.9	0.2	105	1	4	0	8.6	0.5
AEL	319	1	12	1.9	-0.4	274	0	12	0	8.7	1.0
AEW	52	0	2	2.1	-0.8	52	0	6	0	9.4	2.7
AFL	444	1	5	2.0	0.5	434	0	4	0	7.1	0.5
AFR	731	0	4	1.5	0.1	618	1	6	0	9.1	0.8
AJM	252	1	6	2.1	-0.6	231	0	4	0	7.2	0.6
AMM	51	2	6	1.2	0.2	37	0	8	0	6.5	1.3
AMT	40	0	5	1.8	0.9	44	2	14	0	9.3	-0.6
AMX	195	2	9	1.7	-0.1	151	1	7	0	7.8	0.7
ATN	35	0	100	3.5	-0.7	35	0	3	0	6.6	0.9
AZA	224	0	6	2.3	0.7	215	0	6	0	9.8	-0.3
BAL	183	0	13	1.9	0.2	158	0	13	0	9.2	1.4
BAW	541	1	20	1.9	-0.6	534	0	21	0	7.6	0.9
BPA	290	0	100	2.0	0.0	251	0	12	0	9.8	0.2
BSK	43	7	9	1.9	-0.3	41	0	5	0	10.2	-0.5
BWA	82	0	4	2.1	-0.5	69	0	1	0	7.5	1.0
CFC	70	0	9	1.7	-0.4	71	0	10	0	7.6	1.3
CFG	357	0	3	1.4	0.0	304	0	3	0	8.2	0.4
CGL	22	0	0	1.3	0.0	22	0	0	0	6.3	0.3
CKS	133	4	11	1.8	0.3	125	0	8	0	9.2	0.3
CLX	234	0	3	1.7	-0.6	216	0	3	0	8.0	0.5
COA	91	0	47	1.8	-0.3	63	0	51	0	12.3	0.2
CRL	361	1	4	1.7	0.1	286	0	4	0	8.5	1.6
CSA	20	0	5	1.9	-1.1	20	0	0	0	5.9	-0.5
CUB	80	0	8	2.5	-0.8	69	1	7	0	9.0	1.7
DAL	758	0	4	1.7	-0.7	717	0	5	0	8.0	1.0
DCE	93	0	11	2.0	-1.0	92	0	11	0	7.1	2.0
DCS	45	7	11	2.2	-0.7	46	0	7	0	8.2	-0.1
DHL	142	2	100	6.6	-6.4	135	0	100	0	12.4	3.0
DLH	390	0	7	1.6	-0.2	390	1	8	0	6.9	1.2
EDW	73	1	7	1.8	-0.2	67	0	4	0	6.3	1.2
EEZ	39	0	15	2.7	-0.3	36	0	14	0	6.8	1.6
EIA	138	0	100	3.5	1.6	143	1	100	0	22.7	8.0
ELY	192	0	4	1.8	0.0	187	1	3	0	7.2	0.5
ETH	21	0	5	0.9	0.1	21	0	5	0	3.9	0.2
FCA	47	0	4	1.6	0.4	39	0	5	0	10.5	0.2
FDX	688	0	16	1.6	0.2	693	0	17	0	7.9	0.9
FIN	248	0	4	1.4	0.1	240	0	5	0	6.2	0.6
FWI	186	2	5	1.9	-0.2	165	1	5	0	8.2	0.5
GCO	186	0	3	1.7	-0.1	195	0	6	0	9.5	2.0
GRL	77	0	3	1.9	0.6	76	0	0	0	4.3	1.0
GTI	69	0	48	1.7	-0.5	69	0	10	0	5.6	1.0
HLN	175	0	18	2.1	0.0	163	1	17	0	8.7	1.6
IBE	923	0	8	1.7	0.2	679	0	11	0	9.3	0.5
ICE	694	0	3	1.7	-0.4	662	0	3	0	6.8	1.0
IWD	41	2	10	2.6	-0.2	23	0	0	0	5.5	1.1
KLM	829	0	3	1.8	-0.1	760	0	4	0	8.6	0.7
LDI	239	0	6	1.9	0.0	195	0	4	0	7.8	0.4
LOT	130	1	2	1.7	-1.1	128	0	2	0	5.9	0.2
LTU	436	1	6	1.7	-0.3	381	0	6	0	8.8	1.0
MON	47	0	26	3.5	2.1	45	0	0	0	4.9	0.0
MPD	75	1	4	2.1	0.6	43	0	0	0	6.3	1.3
MPH	296	0	3	2.1	-1.0	278	0	3	0	7.3	0.6
MYT	135	2	10	2.3	0.8	126	1	4	0	6.7	0.5
NCA	22	0	0	1.7	0.6	22	0	5	0	6.6	-0.2
NWA	1938	1	3	1.7	0.3	1946	0	2	0	6.9	0.7
OAE	184	0	8	1.7	-0.4	189	0	48	0	19.1	8.4

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
PAC	135	2	6	1.7	0.2	139	0	6	0	10.9	0.7
RAM	187	0	4	2.1	-0.2	135	1	8	0	11.0	0.7
RCH	211	3	100	3.7	-1.2	182	0	100	0	11.5	2.0
RJA	47	0	4	1.6	-0.3	50	0	6	0	9.5	1.2
RZO	83	1	6	2.0	-0.9	71	1	10	0	11.5	1.7
SEU	262	1	6	2.2	0.0	221	0	5	0	8.8	0.3
SHE	22	0	0	1.8	1.0	21	0	10	0	10.1	1.1
SLR	121	1	12	1.7	-0.4	120	1	12	0	8.3	1.7
SVA	23	0	9	2.6	-0.2	22	0	0	0	7.3	-0.3
TAP	204	0	5	2.0	-0.7	140	0	5	0	8.8	1.7
UAE	20	0	25	1.2	0.4	21	0	29	0	13.1	2.6
UAL	326	0	68	2.2	-1.3	328	0	69	0	7.1	1.2
UPS	982	0	42	1.7	-0.2	967	0	43	0	7.8	0.2
USA	136	0	2	2.0	-0.4	120	1	5	0	8.2	1.1
VIR	168	2	3	1.5	-0.1	165	0	2	0	7.3	1.0
WOA	256	1	12	1.9	0.3	245	0	12	0	7.7	1.5
XLA	92	0	3	1.6	0.2	86	0	6	0	9.9	0.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	33540	0	18	1.4	0.2	33540	0	16	0	5.0	0.6
SA	27	0	100	1.7	0.8	27	0	4	0	5.2	1.3
TN	32	0	13	1.8	1.4	33	0	18	0	9.6	2.5

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	343	2	9	2.3	-0.1	336	0	7	0	7.1	0.5
US ACARS	15734	0	24	1.5	0.1	15734	0	22	0	5.3	0.6

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	9	0	7.4	24.7	23.6
DBBH	12	Z	100	18	0	9.0	18.8	16.5
EBUQ	12	Z	100	18	0	12.0	20.3	16.4
ELML7	00	Z	100	11	0	14.1	19.6	13.5
ELML7	12	Z	100	12	0	20.5	40.5	34.9
FQFL	00	Z	100	6	0	8.8	17.8	-15.5
FQFL	12	Z	100	5	0	14.4	19.4	-13.0
FQFM	00	Z	100	10	0	28.5	28.5	0.3
FQFM	12	Z	100	5	0	30.6	32.7	-11.4
KHRH	00	Z	100	9	0	14.2	18.8	12.2
KHRH	12	Z	100	4	0	9.7	16.2	13.0
KRPD	00	Z	100	3	0	15.3	15.4	1.3
KRPD	12	Z	100	4	0	11.3	24.5	21.8
LDWR	00	Z	100	23	0	10.2	14.4	-10.2
LDWR	12	Z	100	30	0	16.9	20.8	-12.2
OXTS2	00	Z	100	3	0	8.7	17.1	-14.7
OXTS2	12	Z	100	2	1	43.0	76.3	-63.0
OXYH2	00	Z	100	3	0	5.7	15.1	-14.0
OXYH2	12	Z	100	2	0	0.5	7.5	-7.5
V2XM	00	Z	100	2	0	3.0	36.1	-36.0
V2XM	12	Z	100	1	0	0.0	51.0	-51.0
WAAH	00	Z	100	2	0	5.5	15.5	14.5
WAAH	12	Z	100	3	1	14.2	15.0	-5.0
WPKD	00	Z	100	2	0	15.0	17.0	8.0
WPKD	12	Z	100	2	0	8.5	15.1	-12.5
ZCBP6	00	Z	100	9	0	16.1	27.4	22.2
ZCBP6	12	Z	100	10	0	15.3	18.8	10.8
03953	00	Z	100	28	0	14.9	17.3	-8.8
03953	12	Z	100	31	0	14.5	16.8	-8.5
04018	00	Z	100	28	0	11.7	16.0	-10.9
04018	12	Z	100	29	1	8.6	14.6	-11.8
04220	00	Z	100	29	0	8.1	25.1	-23.8
04220	12	Z	100	29	1	9.0	29.0	-27.6
04270	00	Z	100	26	0	7.9	17.0	-15.0
04270	12	Z	100	29	0	10.2	22.6	-20.1
04339	00	Z	100	29	0	19.5	26.1	-17.3
04339	12	Z	100	29	0	15.6	25.0	-19.5
04360	00	Z	100	30	0	19.3	29.4	-22.3
04360	12	Z	100	30	0	21.7	37.0	-30.0
08001	00	Z	100	22	0	28.9	28.9	-1.0
08001	12	Z	100	24	0	28.8	29.3	-5.3
08508	12	Z	100	21	0	15.6	26.9	22.0
08522	12	Z	100	13	0	15.6	24.5	18.8
08594	12	Z	100	26	0	14.3	24.6	20.0
71600	00	Z	100	30	0	14.0	28.0	-24.2
71600	12	Z	100	31	0	15.6	30.6	-26.4
72201	00	Z	100	30	0	23.4	25.6	10.5
72201	12	Z	100	31	0	12.7	15.5	8.9
72402	00	Z	100	26	0	11.7	20.3	16.6
72402	12	Z	100	29	0	13.9	16.4	8.7
74494	00	Z	100	24	0	13.0	23.1	-19.1
74494	12	Z	100	28	0	13.4	37.3	-34.8
78016	00	Z	100	24	0	14.3	28.2	24.3
78016	12	Z	100	27	0	18.8	38.3	33.3

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	9	0	6.8	10.8	8.3
DBBH	12	Z	500	19	0	5.6	5.8	1.7
EBUQ	12	Z	500	22	0	7.0	7.0	-0.6
ELML7	00	Z	500	12	0	7.0	7.5	-2.7
ELML7	12	Z	500	12	0	8.1	9.6	5.1
FQFL	00	Z	500	9	0	8.2	16.4	-14.2
FQFL	12	Z	500	7	0	6.8	13.7	-11.9
FQFM	00	Z	500	11	0	6.5	11.3	-9.2
FQFM	12	Z	500	10	0	9.5	13.6	-9.7
KHRH	00	Z	500	10	0	14.0	15.0	5.2
KHRH	12	Z	500	7	0	9.9	12.5	7.7
KRPD	00	Z	500	4	0	11.6	12.3	4.0
KRPD	12	Z	500	4	0	3.5	3.5	0.3
LDWR	00	Z	500	24	0	8.2	8.4	1.9
LDWR	12	Z	500	30	0	13.5	13.7	-2.3
OXTS2	00	Z	500	3	0	9.0	10.1	4.7
OXTS2	12	Z	500	3	1	9.9	13.4	-9.0
OXYH2	00	Z	500	5	0	4.6	8.6	7.2
OXYH2	12	Z	500	2	0	1.0	10.0	10.0
V2XM	00	Z	500	2	0	0.5	13.5	-13.5
V2XM	12	Z	500	1	0	0.0	32.0	-32.0
WAAH	00	Z	500	3	0	9.7	14.2	10.3
WAAH	12	Z	500	3	1	12.6	15.5	-9.0
WPKD	00	Z	500	2	0	2.5	6.0	5.5
WPKD	12	Z	500	5	0	5.1	5.6	-2.4
ZCBP6	00	Z	500	10	0	8.0	26.0	24.8
ZCBP6	12	Z	500	10	0	10.3	30.0	28.2
03953	00	Z	500	29	0	8.9	8.9	-0.5
03953	12	Z	500	31	0	10.6	11.5	4.4
04018	00	Z	500	28	0	10.0	13.4	8.9
04018	12	Z	500	30	1	9.6	12.3	7.7
04220	00	Z	500	30	0	9.4	9.5	1.2
04220	12	Z	500	29	1	8.8	8.8	-0.5
04270	00	Z	500	26	0	8.4	9.6	4.7
04270	12	Z	500	30	0	12.3	12.4	2.0
04339	00	Z	500	30	0	19.8	20.0	3.2
04339	12	Z	500	29	0	11.7	11.7	1.2
04360	00	Z	500	30	0	10.6	10.6	0.5
04360	12	Z	500	30	0	12.5	13.0	-3.6
08001	00	Z	500	28	0	25.1	25.1	-0.5
08001	12	Z	500	29	0	13.8	13.8	-0.6
08508	12	Z	500	21	0	8.6	8.7	-1.2
08522	12	Z	500	13	0	7.4	8.8	4.8
08594	12	Z	500	28	0	8.5	9.0	3.0
71600	00	Z	500	30	0	9.4	15.2	-12.0
71600	12	Z	500	31	0	10.5	14.7	-10.3
72201	00	Z	500	30	0	9.2	12.1	-7.9
72201	12	Z	500	31	0	9.6	13.1	-8.9
72402	00	Z	500	28	0	6.7	8.5	5.2
72402	12	Z	500	30	0	9.2	9.5	2.3
74494	00	Z	500	28	0	9.9	11.1	-5.1
74494	12	Z	500	31	0	5.6	8.9	-7.0
78016	00	Z	500	28	1	9.7	10.2	3.0
78016	12	Z	500	30	0	7.9	9.3	4.9

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	9	0	0	3.8	-1.9	-0.1
DBBH	12	V	100	18	0	0	5.6	-0.2	1.7
EBUQ	12	V	100	16	0	0	6.2	-0.4	0.8
ELML7	00	V	100	10	0	0	5.6	-1.3	2.3
ELML7	12	V	100	10	0	0	5.2	0.0	-1.1
FQFL	00	V	100	6	0	0	5.3	-0.4	-0.1
FQFL	12	V	100	5	0	0	4.6	1.4	0.5
FQFM	00	V	100	10	0	0	6.2	-0.9	0.9
FQFM	12	V	100	6	0	0	5.8	0.4	1.0
KHRH	00	V	100	8	0	12	13.0	-6.8	-1.9
KHRH	12	V	100	2	0	0	14.2	1.2	-2.3
KRPD	00	V	100	3	0	0	7.7	-5.4	2.1
KRPD	12	V	100	4	0	0	10.7	1.4	3.5
LDWR	00	V	100	23	0	0	2.3	-0.3	-0.1
LDWR	12	V	100	30	0	0	2.9	-0.1	0.4
OXTS2	00	V	100	3	0	0	5.8	-3.7	4.3
OXTS2	12	V	100	3	0	0	11.3	-9.3	2.2
OXYH2	00	V	100	2	0	0	1.8	0.3	-0.6
OXYH2	12	V	100	2	0	0	2.8	2.3	0.4
V2XM	00	V	100	1	0	0	2.8	2.7	-0.7
WAAH	00	V	100	2	0	0	2.3	1.5	-0.3
WAAH	12	V	100	3	0	0	6.2	3.2	1.6
WPKD	00	V	100	2	0	0	5.3	-1.2	1.5
WPKD	12	V	100	2	0	0	5.2	-2.9	2.5
ZCBP6	00	V	100	8	0	0	4.9	-2.0	0.8
ZCBP6	12	V	100	6	0	0	3.5	-0.8	2.1
03953	00	V	100	28	0	0	3.8	1.0	0.2
03953	12	V	100	31	0	0	3.7	-0.3	0.1
04018	00	V	100	28	0	0	4.5	0.2	-0.6
04018	12	V	100	26	0	0	4.4	-0.1	-0.2
04220	00	V	100	29	0	0	3.0	0.8	-1.2
04220	12	V	100	30	0	0	3.1	0.1	-0.3
04270	00	V	100	26	0	0	4.1	-0.1	0.6
04270	12	V	100	29	0	0	2.9	-0.5	0.9
04339	00	V	100	23	0	4	7.3	-0.5	-1.3
04339	12	V	100	27	0	7	8.5	1.2	-1.4
04360	00	V	100	30	0	0	3.9	0.2	0.3
04360	12	V	100	30	0	0	3.0	-1.0	0.2
08001	00	V	100	21	0	0	4.6	0.7	-1.1
08001	12	V	100	23	0	0	5.4	0.3	-1.4
08508	12	V	100	13	0	0	6.3	1.2	0.6
08522	12	V	100	12	0	0	4.4	-1.1	1.3
08594	12	V	100	26	0	100	5.7	-0.6	4.1
71600	00	V	100	29	0	0	4.3	1.4	0.7
71600	12	V	100	31	0	3	5.9	0.7	1.6
72201	00	V	100	30	0	0	5.1	2.0	1.3
72201	12	V	100	31	0	0	5.5	0.9	1.9
72402	00	V	100	27	0	3	6.7	0.9	0.6
72402	12	V	100	28	0	0	5.1	0.7	0.3
74494	00	V	100	21	0	38	3.2	0.3	-0.5
74494	12	V	100	27	0	40	5.8	1.4	1.9
78016	00	V	100	20	0	5	8.9	0.7	0.2
78016	12	V	100	20	0	0	7.4	0.1	1.5

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jan 2004

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	9	0	0	4.2	-0.7	-0.5
DBBH	12	V	500	18	0	0	3.4	-0.6	1.0
EBUQ	12	V	500	19	0	0	5.1	0.4	-0.9
ELML7	00	V	500	11	0	0	4.0	-0.7	0.3
ELML7	12	V	500	12	0	0	3.5	-0.1	-1.4
FQFL	00	V	500	9	0	0	3.5	-0.7	-0.6
FQFL	12	V	500	7	0	0	4.8	-0.7	-1.4
FQFM	00	V	500	11	0	0	4.0	0.8	0.5
FQFM	12	V	500	11	0	0	4.0	-1.9	-0.2
KHRH	00	V	500	7	0	0	10.7	-7.0	-1.8
KHRH	12	V	500	4	0	0	9.3	1.6	-0.5
KRPD	00	V	500	4	0	0	7.4	-6.3	0.5
KRPD	12	V	500	3	0	0	8.7	3.6	2.8
LDWR	00	V	500	24	0	0	4.4	-0.7	-0.2
LDWR	12	V	500	30	0	0	4.3	0.3	0.3
OXTS2	00	V	500	3	0	33	10.7	-4.2	5.2
OXTS2	12	V	500	4	0	25	9.9	-3.4	-2.8
OXYH2	00	V	500	5	0	0	5.2	-2.4	2.6
OXYH2	12	V	500	2	0	0	1.9	0.3	1.8
V2XM	00	V	500	2	0	0	5.4	-4.6	-0.1
V2XM	12	V	500	1	0	0	11.5	-1.1	11.4
WAAH	00	V	500	3	0	0	6.1	4.8	0.6
WAAH	12	V	500	1	0	100	20.3	20.0	-3.5
WPKD	00	V	500	2	0	0	2.7	0.0	-1.9
WPKD	12	V	500	5	0	0	7.3	-1.4	1.9
ZCBP6	00	V	500	8	0	0	7.4	0.9	2.6
ZCBP6	12	V	500	8	0	0	4.6	1.2	1.3
03953	00	V	500	29	0	0	5.7	0.5	0.6
03953	12	V	500	31	0	0	4.8	-0.1	-0.3
04018	00	V	500	27	0	0	6.3	1.3	-0.5
04018	12	V	500	27	0	0	5.4	-0.3	-0.5
04220	00	V	500	30	0	0	4.1	0.6	-0.2
04220	12	V	500	30	0	0	3.9	0.9	0.1
04270	00	V	500	26	0	0	4.5	-0.3	-0.2
04270	12	V	500	30	0	0	4.7	0.6	0.9
04339	00	V	500	18	0	5	7.3	-0.4	-0.3
04339	12	V	500	28	0	3	5.7	-0.3	1.1
04360	00	V	500	30	0	0	4.5	0.5	-0.9
04360	12	V	500	30	0	3	5.4	1.4	0.4
08001	00	V	500	28	0	0	4.6	1.1	-0.2
08001	12	V	500	29	0	0	4.8	0.6	-1.4
08508	12	V	500	13	0	0	4.9	-0.8	0.4
08522	12	V	500	13	0	0	4.5	-0.2	-1.1
08594	12	V	500	28	0	100	5.6	0.2	2.3
71600	00	V	500	30	0	3	5.4	0.5	-0.5
71600	12	V	500	31	0	3	6.9	-0.4	2.2
72201	00	V	500	30	0	0	2.4	-0.2	-0.1
72201	12	V	500	31	0	0	2.9	-0.3	0.2
72402	00	V	500	29	0	3	4.9	0.9	0.4
72402	12	V	500	29	0	0	3.1	0.7	-0.5
74494	00	V	500	26	0	30	4.6	-1.7	0.7
74494	12	V	500	31	0	38	4.0	-1.2	0.8
78016	00	V	500	28	0	0	4.7	1.7	1.1
78016	12	V	500	30	0	0	3.9	1.6	0.1

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45